OIL AND GAS FIRST PAPER

Oil and Gas Sectoral Analysis focusing on the Upstream Clustering Opportunities

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List of Abbreviations, Definitions and Acronyms

bbl	barrels
BOOT	Build, Own, Operate, Transfer – time sequence of development that culminates in the transfer of the ownership (or a significant potion thereof) of the asses to the host state (or designated company)
bpd	barrels per day
Bunkering	Bunkering means the physical transfer of marine fuels from one marine vessel to another marine vessel and usually relates to a refuelling concept
capex	capital expenditure
CoCT	City of Cape Town
COGSI	Cape Oil and Gas Supply Initiative, a clustering initiative of the DEDT
DC F	Discounted cash flows – the method of determining the current cost of a project in terms of future cash flows taking into account the cost of capital and earlier negative cash flows that need to be recovered. The critical determinants are the discount rate and the time period of the calculation. A longer project life cycle may attract a lower discount rate, however if there is significant long term country risk, the additional risk premium may wipe out any discount gains.
DEDT	Department of Economic Development and Tourism of the PGWC
DHA	South African National Department of Home Affairs
DME	National Department of Minerals and Energy, which owns amongst other SOEs, PetroSA
DOF	South African National Department of Finance aka the National Treasury
DOL	South African National Department of Labour
DOT	National Department of Transport
DPE	National Department of Public Enterprises, which owns, amongst other SOEs, ESKOM and Transnet
DPE	South African National Department of Public Enterprises
DST	South African National Department of Science and Technology
DTI	National Department of Trade and Industry
DWT or dwt	Dead Weight Tonnes - Deadweight = A measure of the total carrying capacity of a tanker (or other ship) in long tons of 2,240 pounds. Deadweight tonnage (dwt) of a tanker includes the weight of all cargo oil plus the weight of fuel, stores, water and crew. In most tankers, the deadweight capacity is within five percent of the actual cargo capacity.
E&P	Exploration and Production
EPC	Engineering, Procurement and Construction – a term referring to a form of contract issued by operators to contractors for turnkey project implementation. The contractor is not responsible for the installation of the facility in this case.
EPIC	Engineer(ing), Procure(ment), Install(ation) and Construct(ion) - a term referring to the contract that field operators issue to contractors for field development. The Installation aspect of the EPIC has additional risk associated with the contract as the operator now holds the contractors responsible for the overall management of the contract, but usually retains full approval control over key installation milestones.

FETs	Further Education Institutions
FPSO	Floating Production Storage and Offloading vessel.
GOG	Gulf of Guinea
GOM	Gulf of Mexico
IDC	Industrial Develop[met Corporation
INTSOK	INTSOK - the Norwegian Oil and Gas Partners - was established in 1997 by the Norwegian oil and gas industry and the Norwegian Government. The Norwegian equivalent of a national COGSI. http://www.intsok.no/PHP/index.php?categoryid=1
LFC	Liquid Fuels Charter
ME	Middle East
NOCs	National Oil Companies
NPA Report	The NPA commissioned Offshore Oil and Gas Report, completed and handed to the NPA in August 2004.
NRA	National Roads Agency mandated to maintain South Africa's road infrastructure.
NT	National Treasury, the operating name for the national Department of Finance
OGTT	The national Oil and Gas Task Team convened by the dti
opex	operational expenditure
pa	per annum
PAU	Pre-Assembled Unit
PetroSA	The Oil and Gas Corporation of South Africa, the South African National Oil Company
PGWC	Provincial Government of the Western Cape
PPP	Public-Private-Partnership
PSC	Production Sharing Contract – usually the critical determination of the share of the production from a well involving the operator(s) and the owner of the petroleum resource (national government of the oil producing country or private owner where natural resources are not state owned)
ROI	Return on investment – relates to the overall profitability of the project after the investment is paid off. This often related to the WACC and DCFs of other similar projects to determine whether to invest or not. This especially true where operators have a portfolio of assets and decide on an investment based on the overall impact of the return on investment on the entire portfolio of assist. This is often referred to as the 'materiality' concept.[1] Because projects compete 'globally' within a company, the

[1] Suffice to say that in the large transnational operators, such as Shell or BP, this materiality test is played out as a bidding competition between the nationally based market development divisions pitching their best market development strategy with the internal but global petroleum commodity division which in turn puts the various bids forward to the global or regional head office for approval.

In Shell for example, Shell International Gas (SIG) has the responsibility for maximising the materiality of Shells global gas portfolio, whilst Shell South Africa (SSA) is responsible for leveraging gas market developments in South Africa. Consequently for arguments sake, the Australian equivalent of SSA, Shell Australia (SA) will also pitch to SIG to show how its gas market development plan will produce a greater material benefits to Shells international gas portfolio. SSA and SA will then set about leveraging various gas market development projects which provide the maximum netback to the gas price that resulting in SIG getting the best price for its gas in the market. SIG however also has to decide on how the various filed exploration and appraisal campaigns will provide the best security of supply and the lowest cost before making its own pitch for project approval.

	entire spectrum of impacts on the ROI are considered. Consequently two projects may have the same return over time; however one is at greater currency risk and therefore gets shelved.
ROV	Remote Operated Vehicle – used to install deep under sea components of field development
SAA	South African Airways, the partially privatised air transport division of the Transnet Group of Companies.
SARS	South Africa Revenue Services, a division of the National Treasury responsible of collection of taxes and excise revues.
SARS	South African Revenue Services, a division of the National Treasury
SBOP	Subsea blow-out preventer – an integral part of well engineering and maintenance in the UOG
SDA	Supplier Development Agency, an implementation component of the SDP
SDI	Spatial Development Initiative
SDP	Supplier Development Programme
SETAs	Sector Education and Training Authorities, mandated with developing nation training curricula
SOE	State Owned Enterprise, such as ESKOM, or PetroSA
Terminalling	Terminalling is generally related to trading in liquid fuels and involves to core activities, namely sourcing and selling product, and physically storing it at a terminal. A third activity can develop as part of the service to source liquid fuels in one forma and selling it in another, namely primary beneficiation such as basic fractionation to yield fuel oil. Terminalling is in essence a form of supply chain or logistics management.
TISA	Trade and Investment South Africa
TPES	Total Primary Energy Supply
Transnet	Transnet is the bundled SOE responsible for the South Africa governments transport assets
ULCC	Ultra Large Crude Carrier more than 300,000 DWT – in excess of 400m in length, 60m in width and a draft of 20m. Very few ports can accommodate these vessels (non in the US and Europe) and they are generally loaded and unloaded via off shore moorings, such as the single buoy mooring off Durban.
UOG	Upstream Oil and Gas
UOGSC	Upstream Oil and Gas Supply Cluster as a national initiative in contrast to the COGSI, which has a regional identity.
VLCC	Very Large Crude Carrier - from 200,000 to 300,000 DWT or approximately 2 million bbl of crude oil – smaller than ULCCs, 300 - 400m in length, 50 - 60m in width and a draft of 14 - 20m
VLOC	Very Large Ore Carrier - from 200,000 to 300,000 DWT
WACC	Weighted average cost of capital – the real cost of borrowing money for an investor

PREFACE

The consultant would like to thanks the DEDT for the hands on and proactive approach taken to managing a project with tight and delayed milestones that made follow-up consultations and verifications difficult to achieve.

The first point of note is that the terms of reference was finalised *after the signing of the contract* and communicated electronically. Consequently the consultant took the unusual step of copying the terms of reference as an appendix to the report.

Secondly, the consultant has also taken the liberty of commenting on the terms of reference in the context of constraints that may impact on the delivery on this project.

i) The terms of reference require specified pricing and labour parameters from a competitiveness perspective. The global norm for this sector is to maintain strict confidentiality over such information. Attempts to elicit such assistance from a South Africa company did not even elicit a response form the person contacted despite numerous attempts to follow-up and contact from the DEDT in support of my request. Numerous articles addressing the investments in field development and fabrication are premised on disclaimers or acknowledgments that the costing is not 'accurate' and names of clients are omitted *at the request of the client* for commercial sensitivity reasons

ii) due to the highly competitive but conversely uncollaborative nature of the engineering and fabrication sector in South Africa, obtaining specific data relating to projects is difficult and often obtained confidentially from consultations on condition that the information is not published as identifying the source would not be difficult in a small tight knit sector such as this.

iii) The requirement to deliver proposals for organisational arrangements to monitor future project is inappropriate in the first report as there is no clarity as to what project may be promoted. This deliverable will be in the second paper as it is essential part of the policy recommendations.

The consultant would like to thank interviewees for the candour and insight into problems of the past, how these have or are impacting on the upstream oil and gas sector at present and how the way forward could be smoothed. The consultant has taken wide licence to interpret these consultations and to contextualise them in the broader national imperatives and global petroleum value chain.

At the interim appraisal of the draft paper, the oversight committee requested the redefinition of certain industry jargon to make the document more user friendly. The redefined terms that appear in the document are critical success factors being changed to 'necessary conditions for success' and cost, policy, investment drivers being changed to 'conditions that need to be aligned sufficiently for success'.

The consultant would like to remind readers that the 'messenger should not be blamed for bad news' where it can be substantiated and recommendations are made that are unexpected or uncomfortable.

EXECUTIVE SUMMARY

1.1 OIL and GAS: Tough upstream environment for contractors

Suppliers into the Upstream Oil and Gas sector[2] (UOG) are renowned for being harshly competitive and operators are exacting in demands. The generic requirement of all stakeholders whether they are governments, operators or contractors, is consistently reliable delivery of goods and services in time, in spec and in budget. This is no less, if not more, essential in the UOG offshore market, the focus of this paper.

The offshore UOG sector requires tight alignment of multiple stakeholders, which is reflective of the multi-disciplinary collaboration required to deliver exploration and production (E&P) facilities to some of the harshest and most unpredictable environments known. Today, oil and gas E&P teams persist in seeking and extracting petroleum resources from inhospitable and technically challenging frontier plays, to meet the insatiable and growing demand for petroleum products by the global economy.

1.2 E&P activity is boosting the UOG sector but risks are high

It is critical to understand the balance between real demand driven price escalations and speculative premium spikes on oil prices. This has substantial implications for the UOG sector as sustained demand will support a long term view on E&P investments, whilst a preponderance of short term speculative price spikes could result in a medium term price collapse that would leave many investors, including operators and suppliers in a precarious position.

The outcome of this tenuous supply/demand situation is that high prices and anticipated strong demand have injected new albeit cautious life (and capital) into the search for and production of more oil since 2002. With traditional 'easy' oil discoveries in decline, these activities occur in ever more difficult frontier plays where the cost of innovative technology and dwindling labour have previously made such E&P unviable. Consequently, coupled with the US energy policy to increase imports from non-middle east producers, the rush to drill in West Africa is reaching a frantic pace and not likely to calm down in the near future.

1.3 Regional implications

It is this sharp increase in E&P activity on the West African coast that has caught the attention of strategists who believe that the region will have to collaborate in order to achieve the critical mass of services and labour required to meet the demand for off shore facilities and local content stipulations of governments. National oil companies are playing an increasingly prominent role in acquiring E&P rights and leveraging inclusion of local companies in the supply of services to the upstream activities of the multinational operators. Consequently, the Provincial Government of the Western Cape (the PGWC) has taken the bold step of promoting a cluster initiative, namely the Cape Oil and Gas Supply Initiative (COGSI) to take advantage of increased UOG activity referred to above.

This initiative has the tenuous support of the national government indicated by the formation of the national Oil and Gas Task Team (the OGTT) chaired by the national Department of Trade and Industry (the **dti**) to provide national strategic direction to the upstream oil and gas initiatives.

1.4 West/Southern African UOG: Status quo

This pre-emptive narrative provides a historical assessment of the situation facing the COGSI today. The status quo fundamentals are as follows:

i) A sharp surge in frontier UOG sector activity along West Africa's coast, overshadowed by the

[2] The relationship of the UOG to the rest of the petroleum value chain, the global, regional and domestic energy picture as a context for the Western Cape is discussed in more detail in the introduction to the main report.

EPIC risk profile of the sector that has worsened over the past ten years.

ii) Significant domestic engineering and project management competence applicable to the sector with associated trade opportunities which is overshadowed by recriminations regarding past problems and current infrastructure (port and logistical) constraints,

iii) Confident opinion (within the DEDT) that the increased E&P will continue beyond the next decade, hence the need to understand the medium to long term risk associated with UOG investments. Any price crash will decimate the UOG services sector as E&P is reduced[3],

iv) The launch of COGSI to promote the integration of the above fundamentals into a coordinated collaborative and competitive supply hub/cluster located in the Western Cape. COGSI has the unenviable task of leveraging cooperative trade and industrial investments with little or no absolute trade advantage to build on.

For COGSI to be successful, all stakeholders expressing an interest in operating in the upstream oil and gas sector must: **need to want to work together to consistently deliver reliable goods and services in time, in spec and in budget**.

1.5 West/Southern African UOG: Western Cape – necessary conditions for success

There are currently three 'types' of stakeholders involved, namely the relevant government (local and national) departments, the private sector and the commercial state owned enterprises that have both political and commercial imperatives to consider when discharging their mandates. The PGWC's UOG service supply cluster initiative is however dependent on the achievement of the following critical or necessary conditions for success:

i) Purpose built accessible and secure/safe port and engineering fabrication infrastructure to provide engineering, procurement, installation and construction (EPIC) contractors with efficiently managed and safe locations for fabrications (jackets and general engineering) and safe berthing for floating structures for topside completion/conversion.

ii) Close alignment of government, private and state owned commercial enterprise stakeholders to promote collaboration nationally, and prevent unnecessary competition for resources from competing regional initiatives and commercial investors. The purpose being to provide coherent policy clarity and foster consensus around shared and common goals.

iii) Transparent collaborative processes to integrate the current disaggregated competence into a cohesive national capacity that can deliver consistently reliable services in time, in spec and in budget. Including early involvement of contractors in field development decision-making processes and the unhindered flow of information and knowledge.

iv) Urgent involvement of foreign investors in the port and fabrication infrastructure with associated fast-tracked access to appropriately trained and competent labour to achieve rapid development of the service supply hub in support of COGSI's cautious optimal clustering and the PGWC's maximum developmental imperatives.

v) The more parochial application of the NEPAD principles in order to convince all stakeholders that South African involvement in the UOG will provide a secure hub for all investors to procure goods and services in a location already served by world class or 'pedigreed' engineering services companies that will improve west Africa's capacity to deliver on its promises to improve local content and labour involvement in UOG developments.

[3] "The collapse of oil prices from late 1997 to the early 1999 underscored the vulnerability of oil exploration and development operations in the United States. During this period approximately 51,400 jobs in oil industry were lost, 200,000 wells had been abandoned, proven reserves fell 7% -- the largest percentage decline in over 50 years and crude production for 2000 represents the lowest annual U.S. crude oil output since 1950." – see also http://www.findarticles.com/p/articles/mi_m2501/is_1_23/ai_76560793/pg_3 for more analysis

1.6 West/Southern African UOG: Current realities – global, regional and local

The current analysis of the global and domestic status quo reveals the following advantages and disadvantages that impact on the success of the PGWC's cluster initiative:

i) Global realities:

a. Successful UOG service clusters have grown organically from the careful and sometimes serendipitous integration of an 'absolute' competitive advantage (often a natural resource or locational advantage) and the careful and strategic government promotion of several comparative advantages (ranging from strategic incentives to direct commercial involvement – including infrastructure and/or an SOE)

b. High oil prices (real or speculative) have provided much needed capital for E&P investments

c. Extreme price fluctuations in those prices have tempered the E&P investment sentiment for fear of price collapse in the future

d. Caution rules and impulse fools – new E&P frontiers (deep water in the case of West Africa) are often small by 'big' fields' standards[4], expensive to develop, expensive to produce and often have limited/short life-spans which impact on the discounted cash flows used to determine the viability of these projects.

e. EPIC contracts have shifted the balance of responsibility for risk mitigation to suppliers away from operators dramatically reducing the risk/reward balance for the UOG Service Supply Industry.

f. With deep water reserves being exploited and multiple subsea installations, FPSOs are rapidly becoming facility of choice as they can be moved, reused upgraded and converted – saving up to 40% of the field development costs. Consequently shipbuilding competence (including conversions, repairs and maintenance) will have a fundamental impact on the long term sustainability of the UOGSC.

ii) Regional realities:

a. Alternative and available fabrication facilities in West Africa

b. Local content requirements from oil producing countries, such as Nigeria and Angola are successfully levering increased investments in fabrication facilities in West African ports.

c. Trade relations – South Africa has a severe trade imbalance with all of the West African nations which and is often treated with suspicion in investment related matters

d. Locational advantage – numerous global EPIC and fabrication companies have or are establishing yards and facilities in West African nations in response to local content demands and where the locational advantage can be exploited.

iii) Domestic realities:

a. Insufficient port and fabrication infrastructure – NPA report

b. Alternative and competing West African fabrication facilities with significant locational advtage.

c. the competitiveness factor – NPA report

d. Uncollaborative industry relations where SA companies are regarded as being uncooperative and there is a culture of '…follow me, I'm right behind you!" – NPA report

[4] The current largest 20 'big fields' fall in the range from 10 billion bbl up to 80 billion bbl! The largest new find off the West African coast and hailed as the largest of the global new frontier find of the decade (1990s) was the Abgami (Famfa Oil/ChevronTexaco) field of Nigeria estimated a 2 billion bbl. The majority of the US fields fall into e 1-1.5 billion bbl category, so from a US perspective, the Abgami discovery is significant. To put this into context, the Sasol (Secunda) coal recoverable reserves (for coal to liquids beneficiation) are about a billion bbl of oil equivalent.

e. Spatial Alignment of Gauteng and KwaZulu-Natal capacity with Western Cape developments – NPA report and OGTT deliberations

f. Apparent local/national misalignment – local government is perceived as running ahead of the pack and national government of dragging its feet. – industry opinion

g. NIPS – levering local investments especially regarding defence off-set obligations, which to all intents and purposes are being clumsily handled

h. Any SA based UOG activity (Ibhubesi field development) that triggers outsourcing of significant services will definitely add critical mass to the COGSI initiative. - Industry opinion

1.7 Conclusion[5]

In conclusion, the analysis at this stage indicates that a scaled down COGSI initiative could be more viable than initially considered as the strategy envisages a more modest incremental achievement of critical mass[6] for the development of the cluster. Significant leverage is to be sought from NEPAD linkages and initiatives. This however has significant implications for the PGWC, as the DEDT strategy envisages a fairly high profile UOG hub.

This disjuncture could mean that there is misalignment on the perceived KPIs for success and/or failure. Consequently, there is an urgent need to verify the projected turnover figures for COGSI stakeholders and the relative market shares as the initiative will require justification of significant support in terms of infrastructure improvements and investment incentives to access larger market shares than perhaps possible from a more low key approach. The COGSI initiative has been given significant hype and it is essential that the outcomes are achievable and anticipated.

It is important to note that South Africa and the Western Cape, do not have any absolute advantages in terms of the West Coast UOG sector, COGSI cannot offer the cheapest rates (port, steel and utilities), Saldanha/Cape Town are not the closest to the UOG activity and South Africa does not have any significant oil or gas reserves to leverage local content demands in this sector.

The PGWC is therefore faced with an urgent need to leverage interventions from a comparative advantage perspective thorough regional trade negotiation, such as NEPAD commitments and government bilateral deliberations. This would include promoting those aspects of the COGSI initiative that have the most potential to be comparatively better options for UOG stakeholders. The critical issue is that comparative advantages are generally dynamic and change with time, consequently timing is important. Nigeria and Angola are levering local content programs that are forcing contractors to operate from local bases and establish local yards, including fabrication, maintenance and engineering facilities. COGSI needs to be part of these local content negotiations.

However, there are rumours that Ferrostaal is looking favourably at establishing a jacket fabrication facility in Saldanha. Coupled with NPA upgrading the port, these two investors could provide over half the critical mass required to attract other players which will have a magnet type effect. A significant tenant such as Ferrostaal would justify port infrastructure investments. However, should Ferrostaal decide not to invest in the Western Cape, the PGWC may do well to consider the outside possibility that other cluster initiatives are more deserving of resources and time. The Western Cape's reliance on comparative factors to leverage investments COGSI is a double edged sword as the success is in the interventions, however a comparative analysis may show other sectors to be

[5] Whilst other options for development were considered, as per the terms of reference in Appendix 1, they will be dealt with in the appendices to the main report with specific conclusions identified at the end of each section. The executive summary and conclusions are based on the emphasis on COGSI that was expressed in the presentation to the MEDS OvComm and the expectations outlined.

[6] The consultant obtained clarification of the reference to 'new builds' in the COGSI business plan explains the focus on FPSO building in the first draft. New builds in the industry is generally an EPIC concept referring to the main contract. The consultant then assumed that this implied shipbuilding competence in the Western Cape. The clarification indicates that the new builds actually refers to the fabrication of PAUs for integration and hook-up on location or in a yards closer to the field development site. This dramatically changes the weight of the necessary condition for success relating to the development of VLCC and ULCC dry dock facilities. Whilst such dry docks facilities might improve the competitiveness of the cluster, they are not necessary for PAU fabrication, and current docking facilities would suffice. FPSO conversion however would require additional infrastructure and improvements to current infrastructure to be truly competitive.

more appropriately supported and nurtured

Consequently, COGSI must be appropriately contextualised – it is an upstream services supply and fabrication hub. It is essentially a steel beneficiation hub which 'imports' and/or 'exports' prefabricated and/or preassembled steel structures for the UOG sector. Consequently the critical factors that need to be sufficiently aligned must be seen the context of the following factors namely (i) the steel processing (ii) customs and excise regulatory synergy with the industry needs and (iii) the availability of suitably skilled labour for highly technical fabrication. In this context, COGSI and the PGWC are challenged by four primary conditions with sufficient alignment for success, namely:

i) COST factors, including the price, quality and reliable supply of steel. The availability of competitive utilities such as electricity and industrial gasses. Labour market synergy would have to be aligned with sectoral needs.

ii) POLICY factors including infrastructure investments decisions, promotion of research an development centres of excellence, and the cooperation of SARS in terms harmonising the customs and excise regulatory framework to allow for after-hours shipping movements,

iii) INVESTMENT factors that need to be sufficiently aligned for success would include the interventions that advance the Western Cape's comparative advantages. These would include, mitigating the infrastructure risk for developers if NPA also invests, reducing bureaucracy and improving efficiency from a port management perspective and promoting SA as a safe destination in terms of the current geopolitics making certain areas very unsafe.

iv) In terms of (i), (ii) and (iii) above, the optimal flow of information and knowledge should provide data sets that can be interrogated in order to optimise the comparative advantages for locating the various UOGSC components. There must be a sustainable organisation such as COGSI which must be mandated with a long term goal of being the honest broker, holding the cluster together and generating analysis for its members. COGSI would responsible to maintain momentum and becoming the custodian of generic data required to make ongoing such analysis.

It is the consultant's considered opinion that there is an urgent need to appoint a facilitator, who is UOG competent, has a track record of streetwise negotiation in the South African/African context and is also perceived as a non-partisan 'honest broker'. The purpose being to, (a) build trust, (b) achieve acceptance of shared goals, (c) alignment of national and local policy decision making and championship and (d) collate the data sets elicited from the better flow of information between stakeholders.

Investors want 'comfort' and 'direction' in order to 'sell' investment opportunities to company boards and shareholders. From a commercial perspective, this includes collaborative trustworthy behaviour and transparent knowledge flows (cost drivers, engineering process management, available skills sets etc.). Policy alignment would include clear and concrete national championship of the UOGSC initiative at both a domestic and regional (SADC/NEPAD) level.

A high level example would be where South Africa (Saldanha) becomes a recognised PAU fabrication hub, Angola's current piping competence specialises in subsea installations and Nigeria's established yards specialise in integration, or 'hook up' of PAUs for deployment in the Gulf of Guinea. The alignment of these comparative advantage outcomes is extremely difficult in the context of highly nationalistic and often untransparent application of local content legislation.[7]

[7] The Federal Government in Nigeria has set a target of achieving 45% local content in the oil sector by 2006 and 70% by 2010. The current level is about 15%, which provides significant opportunities for 'African' stakeholders, if the Nigerian authorities can be convinced that the application of comparative advantage analysis as to what gets done in Nigeria and what gets done in 'partner African countries' for assembly in Nigeria and how this can be 'juggled' from a local content perspective. Nigeria has shown a willingness to be innovative in this regard by separating out currency value from amount of person hours and commitment to skills transfer that can be optimised to reach an agreed 'local content' commitment by the operators and EPIC contractors.

2 Introduction

South Africa has a powerful and stable emerging economy where the role of energy is critical to the success of achieving macroeconomic goals such as inflation targets and real economic growth. Cheap electricity and competitively priced transport fuels are critical for sustained industrial growth and more especially the surge in exports over the past ten years. Political stability, progressive economic policies and the managed liberalisation of core sectors of the economy have established the sound political economic base from which to stimulate economic growth.

The Western Cape, as shown in Figure 1, is an 'energy island' which imports all of its energy needs either as internal or domestic imports or as external imports from the rest of the world. This situation puts the WC at a disadvantage from an energy perspective, especially in term of petroleum products. Currently the majority of the oil requirements are imported for refining at the Calref refinery, or smaller amounts are obtained from the PetroSA reserves. The majority of electricity is 'imported' from the Highveld where cheap coal abounds.

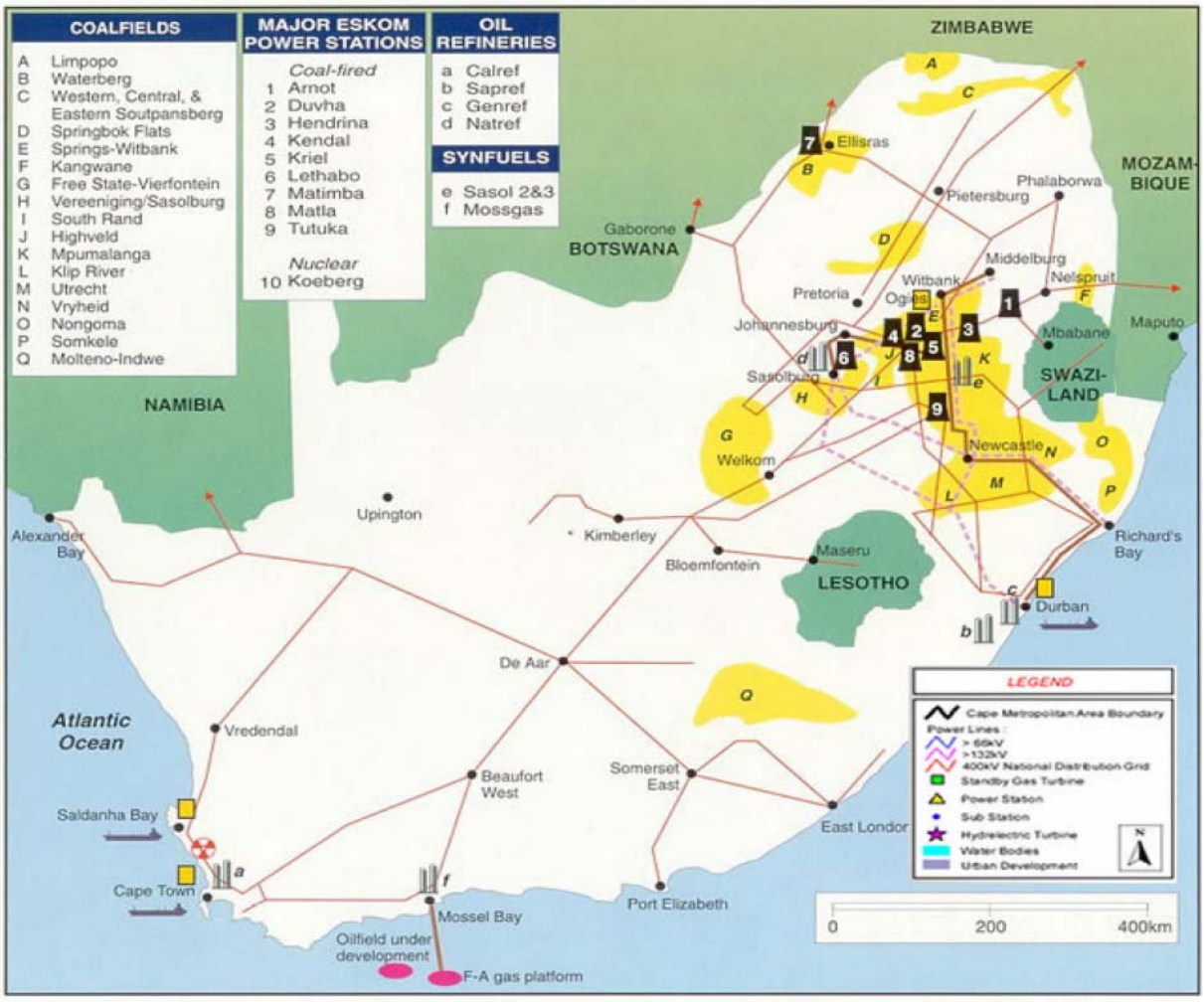

Figure 1: Overview of the SA energy picture - Source DME 1994

Whilst there have been improvements in the capacity in term of generation, refining and transmission, there have not been any significant changes in the location and geospatial context of

the Western Cape's 'energy island' disadvantage, consequently, in this context, the above map is accurate from a strategic perspective. This has significant impacts in terms of locating any energy intensive industries in the Western Cape, as additional comparative advantages will likely have to be exploited to offset the cost of importing electricity, coal and/or other hydrocarbons. Secondary utilities that are energy intensive, such as the supply of industrial gasses will also be affected.

We should not however loose sight of the fact that one South Africa most competitive contenders in the UOG services supply sector is Singapore, an absolute energy island that imports all of its oil and gas. The oil is essential to produce transport fuels whilst ore than half the natural gas is used a fuel for gas-to-power plants.

2.1 Petroleum Value Chain Economics

The basic economics of the oil and gas value chains follows fairly predictable commodity dynamics. Unpredictable demand causes price fluctuations whilst excess investment in supply will tend to depress prices.

Commodities are sensitive to global price dynamics (commodity producers are generally price takers), most producers operate from a 'produce or die' perspective when prices are high. This tends to result in overinvestment (with long project life cycles) and over production. Thereafter periods of excess capacity follow with price depression until the overinvestment or capacity overhang in the market is utilised. However, due to the essentially inelastic demand for transport fuels, price stability in the oil and gas markets is supply modulated.

The Petroleum Value Chain

The petroleum value chain is global with 'integrated' components located through out the world. The value chain has essentially three elements, namely upstream E&P, downstream refining of crude oil into liquid fuels and retail distribution of refinery off-take, generally transport fuels. Each of these components is linked by a logistical aspects that adds little value and the cost to the user is generally determined by the economies of scale and the fixed to variable cost ratio of the transport mode.

The UOG sector has the highest risk and faces significant negative cash flows during the exploration and field development phases. Global oil prices impact heavily on the investments in E&P. The UOG sector can be subdivided into the exploration (seismic and drilling services i.e. field appraisal) the field development (including surface - refurbishment, and new-builds - and subsea installations) and operational maintenance (repairs) and services (engineering and provisioning).

The oil and gas value chains are complex in terms of both the backward and forward linkages that impact on the critical drivers that which will contribute to or detract from an investment decision. The backward and forward linkages are impacted by both market dynamics and technology. Crude oil refining is a continuous process and any disruption to supply will starve the refinery whilst any disruption to demand will create a storage crisis as the refinery 'drowns' in its own off-take.

Supply of transport fuels is driven by the type of crude, the configuration of the refineries and the nature of the demand. These three factors vary with time as the demand for end products changes; however, 70-80% of the refinery off-take is transport fuels (petrol, diesel and jet) consequently the demand derived from the transport sector fundamentally impacts on the petroleum value chain.

The petroleum value chain is both mature and complex, due to the highly risky and technical nature of the supply and widespread distribution of oil and gas products downstream. The value chain is also characterised by capital intensive investments (USD 2-3 billion for a deep water field development and USD 1-2 billion for a refinery) that provide relatively few and fairly highly skilled jobs. The opportunities for SMME's are also limited and are mainly related to service provision to the main value chain and retail service stations.

One may be prompted to ask why all this generic and fairly basic economics has been outlined here and what the relevance to this paper is. The answer is simple. Oil and gas economics are not difficult to explain or understand, yet many people (and analysts) get very excited and emotional when crisis hits the sector and global economics is threatened by market instability. Consequently, wild and outrageous theories abound in such conditions, where proposals and strategies that defy logic are mooted with total disregard for economics basics. This has lead to a humorous concept amongst strategists where one's only comment on a project plan is – "well its works in practise, does it work in theory?"

By throttling supply of crude (either by limiting supply or under investing in excess production

capacity), the producers (and operators via the PSCs) can drive up prices. This in turn provides much needed capital for E&P investments which are constrained during periods of low prices. However the demand for crude is derived from the demand for transport fuels and consequently any supply constraint through the value chain will uncouple the supply demand balance and price instability will ensue. The worst case scenario is when the supply and demand become structurally de-linked (the most fundamental cause of this is or will be peak oil), then high prices and extreme volatility ensue. Currently the global transport fuels demand is increasing faster than the increase in production capacity and discovery of new reserves, coupled with logistical constraints where refinery and shipping capacity is stretched; producers have limited control to modulate prices downwards by increasing supply.

> Regarding the Saudi's thoughts about oil prices, Adel al-Jubeir said in an interview on *CNBC* that high oil prices are starting to slow down the global economy, and that "$50 a barrel is way too high." Saudi Arabia is prepared to sell oil to "whomever wants it," he said. (Oil Slips on Saudi Quips 4/26/2005, Elinor Arbel, The Street)

The attempt by OPEC and particularly Saudi Arabia (as the main swing producer to date) to allay fears of higher oil prices by committing to sell as much oil as needed, is an indication of the panic in the markets at present. The reality however is that OPEC capacity is stretched to the limit at present and smooth talk does not appear to be smoothing the market.[8] Undermining speculation does not alter the reality that there are dwindling supplies of oil and limited capacity to deliver what there is to the market.

2.2 A South African Upstream Oil and Gas Services Cluster

What has this to do with the UOGSC initiative in South Africa? Everything! Investments in field development and production along with investments in port and logistical infrastructure are not frictionless and overinvestment penalised by the market price collapse, loss of revenue and ultimate slashed investment budgets. This is critically important where one's fortunes are tied so closely to decisions made by investors who respond to unpredictable fluctuations in the market. Nowhere is this truer than in the UOG service sector.

Consequently, an efficient and competitive services supply cluster that provides outsourced services to operators and EPIC contractors is critical to the overall sustainability of field operations. This efficient integration of the value chain and the subsequent optimal mitigation of risk due to good alignment will reduce the risk premium applied by financiers and reduce the discount rate when determining the viability of projects. Government involvement in the essential services and port infrastructure will provide significant comfort to investors who in turn have to invest significantly in

[8] In 1997, world excess production capacity was 3% of demand (78 million bpd) or just over 2 million bbl. Since then demand has increased to 80 million bbl, and the surplus capacity has not kept pace with the growth. Saudi Arabia has always been the main swing producer, but investments in non-Middle East (ME) production during the 70s and 80s resulted in depressed prices and falling investments in production capacity in the Persian Gulf.

Today, non-ME production is peaking and the demand surge has placed a supply burden on Saudi Arabia as the swing producer. The supply risk (constrained OPEC swing production capacity) and bottle necks in the value chain (transmission, shipping and refining) have resulted in speculative premium of 20 - 30% on the oil price or approximately USD 11 per bbl.

Investor concerns over price instability and OPEC memories of the impact of excess production capacity during the 80s (at the time OPEC had about 14 billion bpd of excess capacity!) and 90s (and the corresponding underinvestment in production capacity during the past 20 years) has resulted in cautious responses to increasing production investments until the nature and sustainability of current demand levels can be determined.

back of port and fabrication facilities.

Many investors therefore view the Public-Private-Partnership (PPP) as a risk mitigating vehicle that reduces project risk i.e. (Port infrastructure + fabrication engineering facilities) plus (Public + Private) minimises project risk in the view of many investors. Hence, most oil and gas sector projects require intense strategic negotiation during conceptualisation and start-up to align the often powerful and usually varied vested interests of the public, private and community sectors. Most major UOG investors are multinational operators who own or manage global portfolios of oil and gas reserves. They are particularly sensitive to country risk after the Persian Gulf nationalisations of the '70s and the operation challenges of West Africa and South America.

A vigorous negotiation environment ensues where national governments, contractors and global portfolio managers attempt to find common ground from which to promote the development of various oil and gas reserves. Consequently, any stakeholder wishing to enter the oil and gas sector, especially the UOG sector should have an astute understanding of the generic dynamics in the global arena, be able to apply these to the regional theatre and consequently be able to use these insights to leverage parochial developments that can harness regional trade synergies.

2.3 The Global perspective

During the first half of the twentieth century, oil replaced coal as the primary energy source for transport. Coal has been displaced from almost every previous position of dominance in the energy sector except regarding electricity generation is still dominated by coal, but gas-to-power projects have grown by a third over the past 15 years according to World Bank capital project funding since 1980. The global energy sector has been characterised by mergers and acquisitions over the past 10 years as the profitability of various trans-national oil companies have been eroded by nationalisation of oil reserves, competition focusing attention on cost cutting, achieving economies of scale, optimising synergies between various energy value chains and sources of energy and technological innovation.

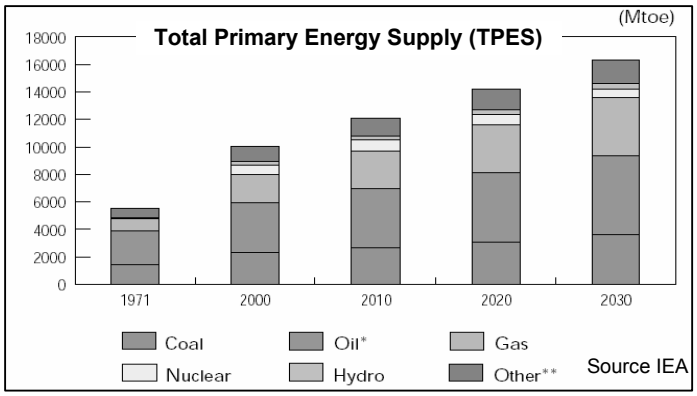

Table 2: Global Energy Supply

This is particularly notable with regard to gas-to-power where efficiencies have virtually doubled in twenty years. The International Energy Agency only forecasts up to 2030, by during which time, oil and coal shares of TPES hover around the 35% and 23% shares respectively over the next thirty years whereas gas supply increases by 20% in the same period. Various forecasts exist for the 21st century energy supply[9], however general prediction is that increases in the coal and oil share of the TPES will remain relatively flat for the rest of the twenty first century whilst the growth in natural gas demand is expected increase 10 fold during 2040, peaking by 2060, whereas consumption of

[9] The first structural break in most forecasts is determined by the authors' predictions of when oil reserves start to decline and gas picks up the slack. The second structural break occurs when gas supply peaks and alternatives (renewables and nuclear) pick up the slack. Most authors predict that the oil supply slope will level off and decline slowly as energy markets adjust for improved efficiency and technology advances in the face of declining reserves. Gas usage decline post 2050 will probably fall quickly as most gas is being used for power projects consequently there are alternative power generating technologies (nuclear) available almost immediately whereas transport fuels will probably be pre-empted by a fundamental change in technology which will require time to penetrate transport sectors.

alternative energy sources is expected to increase sharply from 2060.[10]

In Europe and America, powerful electricity and gas utilities have expanded beyond the traditional national borders. Trans-national ex-public utilities have become the new face of the global energy sector, exporting technology and services throughout the world, especially expanding into new markets in developing countries. Consequently, many governments of developed countries are supporting their energy sectors and cooperating with the governments of developing countries to liberalise energy markets, facilitate the alignment of the various market rules and stimulate trans-national competition and investments.

Finally, the World Summit for Sustainable Development conference in Sandton, Johannesburg in 2002 firmly placed renewable energy on the global timetable for energy development over the coming decades. Consequently, the transfer of technology and services related to renewable energy programmes are being supported by many governments. However, despite these developments, world energy demand (Giga or 10^9 Tonnes of Energy equivalent - GToe) is projected, by the IEA, to grow by between 30% – 50% by 2020, with the greatest rate of increase in demand coming from developing countries which is expected to increase at least three fold by 2020.

2.3.1 OIL: Strong demand, constrained supply and high prices

The demand for petroleum (or crude oil) products is derived from the transport sector and is essentially inelastic with 80% of the world demand for transport fuels met by crude oil fractions or derivatives. Developing economies typically have energy intensive economies where increased mobility (labour and goods and services) corresponds to increased growth in GDP, as illustrated in Figure 3. The past ten years witnessed a dramatic increase in the proportion of world demand for crude oil from China and India[11] and a steady increase in the level of imports by the US[12] and other OECD countries This demand is not expected to abate,[13] increasing pressure on the oil producing nations and operators to find ever increasing supplies of crude oil and gas. The imbalance from the demand surge has been exacerbated by the supply bottlenecks related to types of crudes and refining capacity required to meet he transport fuels demand.

[10] In the graph above, * Includes bunkers. ** Other includes combustible renewables & waste, geothermal, solar, wind, tide, etc.

[11] IEA estimates Chinese and Indian demand will grow 970,000 barrels per day (bpd) this year - nearly 40 per cent of total world growth. China accounts for the lion's share, with 840,000 bpd of incremental demand. http://www.chinadaily.com.cn/english/doc/2004-09/28/content_378979.htm

[12] US oil imports have risen from approximately 27% in the mid 1980s to 56% in 2003, coupled with the steady decline in US production, the US import demand trend is set to increase despite manipulations achieved by using the US Strategic Product Reserve (SPR), as this simply feeds peculation as SPR falls and the looming need to replenish stocks. See: Gibson Consulting @ http://www.gravmag.com/oil.html and Arizona state @ http://www.azgs.az.gov/Winter2001.htm

[13] China is expected to increased imports of Oil by 580% between 2000 and 2030; whilst India is expected to increase oil imports by 400% in the same period. http://www.iea.org/textbase/work/2004/cambodia/bj_session3.2-Ehara%20presentation.pdf

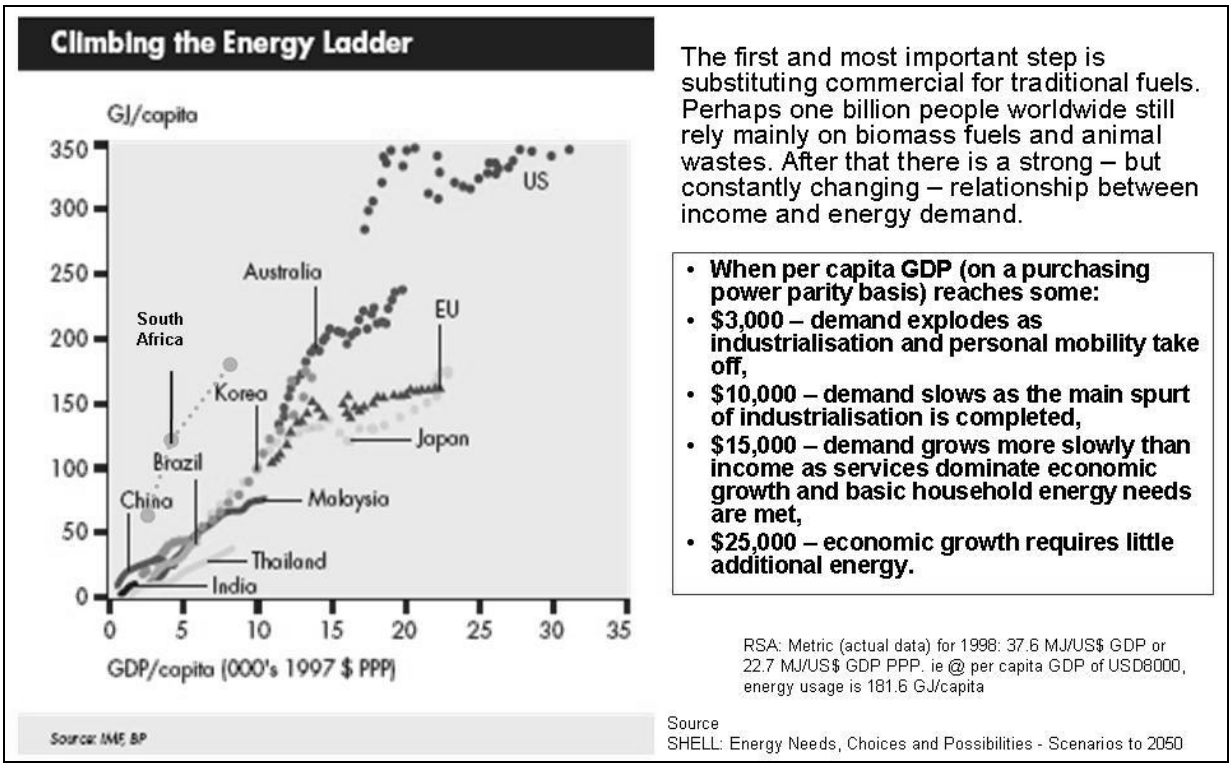

Figure 3: South Africa on the energy intensity graph

National oil companies now control over 80% of the worlds reserves, but have limited facilities or capacity to increase the supply. Additional production capacity is often delayed as transnational and national oil companies battle over royalties and/or production sharing contracts (PSCs). US energy/foreign policy have also triggered geopolitical instability that makes operators jittery about high risk investments. Any threat to stretched production or supply capacity destabilises prices and generally pushes them upwards.

Ironically, high prices coupled with sustained and extreme fluctuations dampen the investment appetite as predictability is undermined.[14,15] Consequently, investments are hedged at meeting demand, with little investment in excess or 'swing' capacity.

2.3.2 OIL: Supply threats (real or perceived) destabilise prices

In the past, oil producers (essentially OPEC) reduced or increased supply at will, and used swing production capacity to modulate supply and stabilise prices if and when the market overheated. To day, the 'capacity overhang' is virtually exhausted and any speculation in either increased demand or supply interruptions results in a price surge as brokers' hedge against future price spikes.[16] The

[14] See the article at the following URL for full analysis: http://www.accenture.com/xd/xd.asp?it=enweb&xd=industries%5Cresources%5Cenergy%5Cener_market.xml

[15] Bassam Fattouh @ http://www.mees.com/postedarticles/oped/a47n38d01.htm

[16] Supply drivers in the petroleum value chain, are: (i) the type of crude and (ii) the configuration of refineries to process the specific crudes. The nature of the demand in terms of the types of petroleum products being demanded based on the time of the year, the weather etc. will require swing producers to meet demand surges. Previous excess capacity has shrunk from 1.5 million bpd 5 years ago, to just under a million bpd. Consequently, if a refinery of 400K bpd and a pipeline interruption of a few hundred thousand bpd, looks set to persist for more than say three months, the market responds by speculating on insufficient production capacity to meet the interrupted supply of both crude and refined

markets are today reflecting the increased demand, limited investment in capacity to supply through fluctuating and high prices.

Notwithstanding investment decisions, the greater long term concern is that global oil production is 'topping out' or peaking as insufficient new reserves are found to replace current production this is also referred to as 'peak oil'. Peak oil is inevitable, but unpredictable as it will only be apparent after the fact. This structural constraint in the market has a structural impact of generating an upward trend in oil prices, which is augmented by the near exhaustion of past capacity overhang. Anticipation of demand surges and/or supply constraints (of crude oil and/or its beneficiated products), *throughout the value chain*, fuels speculation and places an additional speculative premium on crude prices in the market.[17]

2.4 The regional outlook – NEPAD and SADC

The impact of the hegemonic shifts in the world order has not only affected Europe, but has had impacts in Sub Saharan Africa (SSA), where the various states were split along both superpower lines from a security perspective and along colonial lines with regard to trade flows which were usually characterised by centre/periphery power dynamics.

Africa is beset with untransparent market rules and poor governance which have put upward pressure on the transaction costs, deterring many investors. Also the political risk associated with capital projects often requires such a high premium to mitigate risk that the economics of such projects are unsustainable. Firmly embedded in this difficult trading environment, the command economies that characterise Africa have resulted in fragmented regional and continental markets dogged by high inflation rates, post SAP[18] debts overhangs, low economic growth and high population growth compounded by high unemployment and unstable exchange rates culminating in chronic civil strife and geopolitical power struggles.

Yet trading blocs representing the geo-economics are in place and function to varying degrees of success, namely SACU and SADC (South), COMESA (east) and ECOWAS (west) to mention a few. Africa already has limited capacity to effect regional trade arrangements and now with NEPAD these resources are being stretched even further.

Geopolitical instability fundamentally affects the energy supply chains throughout Africa, especially in Sub Saharan Africa which destabilises security of supply and results in shifting energy consumption patterns. South Africa's energy sector is perhaps the most organised and consequently one of the more powerful in Africa however; ad hoc regional cooperation and limited harmonisation pose a threat to African and Southern Africa's development.

Africa is currently focusing on the NEPAD strategy to resuscitate the continent through coordinated Afrocentric policies to attract investments, harmonise markets and regulation thereof, stimulate economic growth, introduce transparent governance mechanisms and alleviate poverty. In this context, South Africa plays a significant role with President Thabo Mbeki playing a central role in the

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product over a twelve month period (a typical O&G futures scenario). The subsequent speculation on future supply and prices puts upward pressure on the oil price more immediately and with a certain element of panic as players position for an impending supply crisis. See also http://www.energybulletin.net/2341.html .

[17] In the US , high petrol prices are surmised to be triggered throughout the value chain, by amongst other factors, the high cost of crude (this also has to be seen in the context of the types of crudes demanded by the refiners and how this creates price premiums for lighter sweeter crudes), the 100% refinery capacity utilisation, the weakening dollar (more dollars for crude), the logistical cost of distributing transport fuels, the socioeconomic crisis in Venezuela and the impact of credit card surcharges in the retail sector putting pressure on retail margins. For further analysis, see http://www.gravmag.com/oil.html

[18] SAP = Structural Adjustment Programme

formation and launch of the NEPAD strategy and the subsequent global road show to motivate support from industrialised countries for trade and investments to achieve it goals.

In the Energy sub-sector, the NEPAD Progress Report and Initial Action Plan, June 2002 makes it clear that, quote,

> "The challenge is to develop fully the energy resources of the continent in order to deliver affordable energy services. Africa's rich energy resources will be developed through regional cooperation. Prioritised projects cover:
>
> - Power systems
> - Gas/oil transmission
> - Studies
> - Regional capacity building
> - Regional facilitation
>
> Feasibility studies have been completed for all the projects listed. The next stage is to accelerate implementation".

Most of the energy projects envisaged in the context of NEPAD cooperation and collaboration relate to additional electricity generation, regional integration of the transmission sectors and sub regional integration of markets through the creation of power pools. This is significant as the leverage required to access the Nigerian markets from a COGSI perspective may receive a lower priority. Consequently leveraging UOG sector trade opportunities may be more appropriately achieved by networking access to bilateral and regional trade negotiations. In this regard the **dti** and **dme** regularly engage in deliberations with counterparts in the energy sector, Nigeria is especially keen to trade with South Africa in this regard.

For many years, African crude oil producers, particularly Nigeria and Angola, exploited crude oil reserves and crude exports have not generated any counter trade benefits for the producing nations either in the form of refined product exports or local involvement in field development. Nigeria is however now addressing the comparative aspects of its oil producing status and demanding increased local content from UOG operators and contractors in all aspects of the field development and oil and gas beneficiation projects. Consequently Addax, Sea Lift, TotalFinaElf, Shell, ChevronTexaco Halliburton and LTA-Grinaker have all established offices and/or engineering operations in Nigeria. Angola is following suit and Stolt has established, and currently expanding a subsea piping and risers fabrication yard there.

2.4.1 Southern African Development Community - SADC

In 2003, the combined Gross Domestic Product (GDP) for Southern Africa was estimated at US$173.8 billion. Individual national economies are structurally diverse and at varying stages of development. South Africa, the region's most developed economy, has a GDP of US$156.9 billion, which is nearly ten times the combined GDP of the other Southern African countries. The region's dominant economy, South Africa, accounted for 85.1% of the region's energy consumption, 72.7% of its energy production, and 88.4% of its carbon dioxide emissions.

While the most easily transported energy resources, in particular oil, have long been traded internationally, planning of energy infrastructure, especially electric grids, but also petroleum refining and distribution, was largely confined to the territory of the nation concerned. However, constraining energy planning and development within national borders is sub-optimal in several critical respects:

- As the geography of energy supply options in no way corresponds to political boundaries, the cheapest and cleanest energy source for a given area may well lie just across the

national border rather than in a distant area of the same country.

- Many national markets are too small to justify the investment needed to develop particular energy supply opportunities. Joining national markets can provide the economies of scale to overcome this.
- As markets mature and competition is introduced, the integration of small neighbouring markets can provide the scale necessary for competition to be effective.
- Cross-border energy supply often also provides greatly enhanced diversification of energy source - a key component of energy security.

Less tangibly, but importantly, joint energy project development can help build closer ties between countries through closer collaboration and increased inter-dependence. In March 2004, the SADC executive secretary announced a strategic plan that sets out measures and time frames for the economic integration of the region. Some of the outlined measures include: the creation of a free trade area by 2008 and a common market pact by 2012. The plan also states that policies, regulations and legislation on petroleum, gas and electricity in all SADC countries are to be harmonized between 2004 and 2006.

2.4.2 Upstream Oil and Gas

In late February 2004, South Africa's synthetic fuels and chemicals producer Sasol announced the first delivery of natural gas from the Temane natural gas fields in Mozambique to Sasol's synfuels plant at Secunda, near Johannesburg. The gas was delivered using the 865 km purpose built transmission pipeline that runs from the Mozambican gas fields to Secunda in Mpumalanga.

The US$1.2 billion pipeline and gas development project is a joint venture of Sasol and the governments of Mozambique and South Africa. The cross border harmonisation involved in this project and the concomitant mitigation of risk were a critical success factor in terms of both investor confidence and improving the economics of the entire project. The Mozambique/South Africa gas project incorporates the only natural gas infrastructure in the SADC region.

PetroSA is the only other South African player with upstream operations exclusive to the off-shore.[19] The past fabrication and current repairs and maintenance contracts have developed significant pockets of competence with numerous global EPC contractors operating or represented in South Africa, such as Stolt, Dresser Kellogg SA, Expro, FMC, Schlumberger, Flour and Bateman. Consequently, South Africa has an abundance of skilled and semi-skilled labour in all disciplines and categories concentrated around the major industrial nodes of Cape Town, Durban, Port Elizabeth and Gauteng and of course Mossel Bay, particularly in the mechanical trades, such as:

- Fitters
- Boilermakers
- Welders
- Riggers
- Pipe Fitters etc.

However the major constraints is the erratic nature of the UOG market that tends to result in attrition of skilled labour to other sectors where they are difficult to entice back and those that simply leave the sector through unemployment or reskilling. This creates a significant opportunity to upskill UOG workers for new projects, but with generic skills that enable them to remain mobile – an essential employability factor for UOG workers.

[19] This paper does not deal with PetroSA's onshore downstream operations which include the GTL plant in Mossel Bay.

The problem of limited availability of skilled labour is a global problem, and in the UK for example the average age of an oil/gas worker was 50 and an initiative is under way by the United Kingdom Offshore Operators (Association) - attract new entrants to this job market.

2.4.3 Regional Strategic outlook

State utility companies still tend to monopolise the SADC energy sector and exhibit various degrees of regulatory and/or policy capture proportional to the influence of energy industry players in the managed liberalisation of the economies in the various member states. Cash strapped governments are finding it more difficult to support these utilities in capital expansion projects often resulting in PublicPrivatePartnership or private investments. Consequently, the anticipated generation and refinery capacity constraints from 2010 (electricity) and from 2015 (petroleum) at current investment and economic growth rates need to be carefully assessed in order to maintain security of supply in these two strategic sectors. From an integration and cooperative perspective, future funding strategies should address SADC reliance on South Africa, poorly developed energy markets beyond South Africa, where regulatory unbundling and fragile harmonisation which succeed in spite of themselves.

Also, to the north, political instability undermines the investment climate, and consequently, technology transfer to the region where various studies have shown, from a theoretical perspective, that technological development in developing nations will be a fundamental component of any economic growth package designed to promote development through capital projects and/or SMME's. However, all is not doom and gloom as evidenced by the success of the Mozambique/South Africa Natural Gas Project that involves a bilateral cross-border trade agreement between the sovereign states of the Republic of South Africa and Mozambique, a tripartite Public Private Partnership with equity shareholding by all signatories.

The SADC represents a significant investment destination for SA companies, especially those that have experience in working in the African environment. Angola is probably the most important SADC member from an UOG perspective; however all of the coastal countries on of the Gulf of Guinea rim have active UOG industries that are being engaged by South African firms. PetroSA has recently obtained farm in rights in Equatorial Guinea and South African companies are involved in DRC, Cameroon and Sao Tome/Principe. The South African government has regular contact through high-level delegations with these countries.

The key UOG market however is the Nigerian UOG sector, which is not a member of SADC, which means that the most obvious method of leveraging Nigerian support for SA companies is through bi-lateral negotiations and/or NEPAD structures and negotiations. South African companies are already doing business Nigeria and these companies should be solicited for information and direction how best to engine with Nigerian authorities on a commercial basis in parallel to the political engagements by the national government.

2.5 South Africa – the national position

Since 1994, the energy sector in South Africa has been in the spot light from both a regulatory and an empowerment perspective. The Department of Minerals and Energy and energy sector are transforming to deliver energy solutions for the benefit of all South Africans and competitive energy inputs to the economy as a critical investment driver since the return of South Africa to the global economy.

The fundamental driver to changes in energy policy have not surprisingly resulted from the new national priorities of correcting the distorted allocation of South Africa's resources in order to improve the distributional (per capita benefits) efficiency of the economy whilst optimising its

dynamic (macroeconomic) efficiency. In 1996, Growth, Employment and Redistribution (GEAR) macroeconomic policy was launched with the concomitant policies and commitment to economic stability in terms of economic growth, inflation targeting, exchange rates and the unemployment rate. However despite these policies, South Africa is a developing country an exhibits a typically high and increasing energy intensity, as reflected in Figure 4 above, as people become more mobile and a greater reliance on energy intense commodity sector such as mining and mineral beneficiation.

The objective of these macroeconomic strategies from an energy perspective was to stimulate more efficient use of the available energy resources, make energy more affordable and accessible and minimise the energy costs to the economy stimulating economic growth and job creation. A critical aspect of these laudable policies was the parallel unravelling of the structural distortions referred to in the previous section, namely the deregulation of the energy sector to attract investments and stimulate competition.

For the PGWC, the impact of the national energy policy is not as critical from an UOG perspective as the trade and industrial policy as the main opportunities are in the trade and industrial sphere where the emphasis is on export of goods an services from the western cape to the wets African UOG sector. This will require close collaboration by the public and private sectors to leverage competent services from a supply base in the Western Cape to the field development project on the African west coast.

The **dti** has convened the Oil and Gas Task Team (OGTT) to manage the national and strategic aspects of the coordination, whilst the PGWC has launched the COGSI initiative to galvanise domestic synergies into an UOG services hub based in the Western Cape.

2.6 Western Cape, the local perspective

The Western Cape faces significant challenges in terms of its ambitions in the UOG markets. Despite the presence of pockets of competence and a relative proximity to the African west coat UOG developments, the advantages that the PGWC and COGSI can exploit are generally comparative in nature and require dynamic and timeous action with significant capital investments to achieve critical mass. In the absence of any verifiable policy imperatives, the most significant development in the oil and gas sector is the Cape Oil & Gas Supply Initiative (COGSI). This initiative is best summed up in the COGSI business plan:

> The Cape Oil and Gas Supply Initiative is a Special Purpose Vehicle PUBLIC PRIVATE PARTNERSHIP Company established to promote and develop the Western Cape, supported by South African Industry as a whole as a Supply Hub and Fabrication Centre to the offshore oil & gas market in West Africa.
>
> The initiative draws on the combined strength of the Western Cape's strategic geographic position on international trade routes and wide range of supplies and services that South Africa can offer to the relatively undeveloped West African market. The initiative recognizes that South African industry is relatively new to the exacting demands of the oil and gas industry and aims to establish international partnerships with foreign companies, Energy Cities and Associations.
>
> The initiative is driven by the opportunities in the high growth offshore oil and gas market developing in West Africa and aims to secure a share in the investment in supplies and services and development projects that are currently flowing into the USA, Europe, Asia and the Middle East.

This initiative, in terms of the business plan, exhibits an in depth strategic analysis that positions the initiative to promote the cluster and generate the critical mass required to sustain such a bold vision. COGSI's strategic analysis and subsequent strategic plan is well aligned with sector needs. The strategic plan contains a focused and astute assessment of the market potential, pitfalls and critical success factors that will ultimately determine the success of the initiative.

This initiative is the coalescence of a number of activities that were promoted by various stakeholders such as the NPA, DEDT and DTI. Foresight from the PGWC correctly assessed the need to formalise and streamline the various efforts in order to align common interests without undermining the competitive nature of the individual activities related to specific services being offered. The strategic understanding of the sector and the national perspective seem to be less obvious.

The COGSI initiative is currently facing severe constraints that are rooted in the misguided rush into the marketing of the initiative without considering the strategic commercial implications and the national/local alignment implications thereof. Consequently the commercial coordination is hampered by an incoherent policy message and the public sector alignment is undermined by suspicions and turf battles that threaten to develop into terminal inertia that may not threaten the initiative per se, but could significantly undermine its success and long term sustainability.

2.7 Summary

The **global** energy picture warns us that the threat of peak oil and dwindling swing production capacity will undoubtedly destabilise and raise prices however producers are far more careful about over investing in supply capacity after the lessons of the 80s and 90s. Demand is unwavering and the steady delinking of supply and demand makes global management of the petroleum sector ever more difficult. The positioning of major consumers to exploit oil reserves has generated extremely unstable geopolitics. These market shocks whether real or perceived, trigger speculative trading in oil and gas futures which has placed a 'speculative premium' on the oil price.

Understanding the dynamics between demand driven price escalations and speculative price spikes is the key to strategising future investment in production in order to meet demand growth, with sufficient swing capacity to manage external price shocks. The global supply is steadily reverting back to Persian Gulf predominance (pre 80s) with the maturation of the non-ME fields which has lead to a surge in exploration in frontier plays such as West Africa.

The **regional** and **continental** picture is essentially similar with the steady wail of the market for more light sweet oil triggering frantic activity on the African west coast. Although the operators are aware of the global production/supply anomalies that govern their investment decisions and consequently many fields are being developed in an incremental fashion using mobile production facilities (FPSOs) that can be redeployed should investments become unviable. Notwithstanding, the average cost of deep water off-shore fields on the African west coast is ball parked between 2 billion and 3 billion US dollars and estimates vary widely from 20 to 100 billion US dollars on investment in the region over the next ten years.

At a **local level**, the Western Cape has little to gain from an energy perspective, but trade opportunities from a locational advantage, offer hope to rebuild the engineering driven off-shore repairs, maintenance and fabrication services to the African west coast UOG sector. SA has learned many lessons from the PetroSA and Mozambique Gas Projects in terms of aligning public sector policy making, private sector collaboration, skills shortages and cross border harmonisation that provides significant skills that can be harnessed to provide a comprehensive management of any UOG services initiative. The critical issue will be to leverage NEPAD support, coordinate public and private investments and promote a collaborative environment for commercial players.

3 Necessary conditions for success

3.1 Clustering – necessary conditions for success

The COGSI initiative is essentially a clustering initiative. Clustering is not new and there is a wealth of literature that provides insight into the requirement for successful clustering. Various resources have provided the generic list below:

Table 4: Critical Factors for Successful Cluster Development

Clustering success factor	Clustering success factor
➢ A strong science and technology base	➢ Entrepreneurial culture
➢ A growing company base	➢ Ability to attract key staff
➢ A skilled workforce	➢ Availability of finance
➢ Suitable Premises and Infrastructure	➢ Effective Networks
➢ Business support services and large companies in related industries	➢ A supportive policy environment

Source: Development Agency for North East England

High-level cluster evaluations can be performed by accessing various sources to obtain baseline economic data for quantifying the above factors. For example the ratio of labour employed in Saldanha in relation to the employment levels in the UOG sector. The cluster parameter may be 50%, in which case anything below that may indicate a weakness form a cluster perspective.

Similar quantifications can be applied to, inter alia, the value of business, how many business are involved in UOG from all business in the area etc; however it is not possible in the scope of the task to complete such an analysis, although it is the consultant's opinion that such a high-level analysis cannot be found in any of the literature and the concern is that many of the critical cluster drivers are assumed.

3.2 The risk profile of the UOG[20] services sector

The past ten years as seen a shift in the risk profile of the UOG sector where operators have become powerful manipulators of the contract market in order to transfer increasing levels of risks onto the contractors than was previously possible. According to Mr Edward Heerema, the CEO of Allseas Group, this silent revolution has been brought about by the increasing use of the Engineering, Procurement, Construction and Installation (EPIC) and contracts.

The installation component has required contractors to take a much higher risk in the development of innovative manufacturing. (See Figure 4 below) The outcome of this shift is that the contractors have consequently merged and acquired one another during the 1999 to 2004 period. The goal of these mergers was economy of scale and efficiency in order to be more competitive. The outcome is that operators have simply become tighter with their budgets and regard EPIC contractors as a source of cost and vehicle for off-loading risk

[20] The Terms of Reference called for additional options to be considered. However, the presentation meeting of the oversight committee indicated an emphasis on analysis related to UOG and COGSI, and consequently the analysis for the other options has been removed to the appendices.

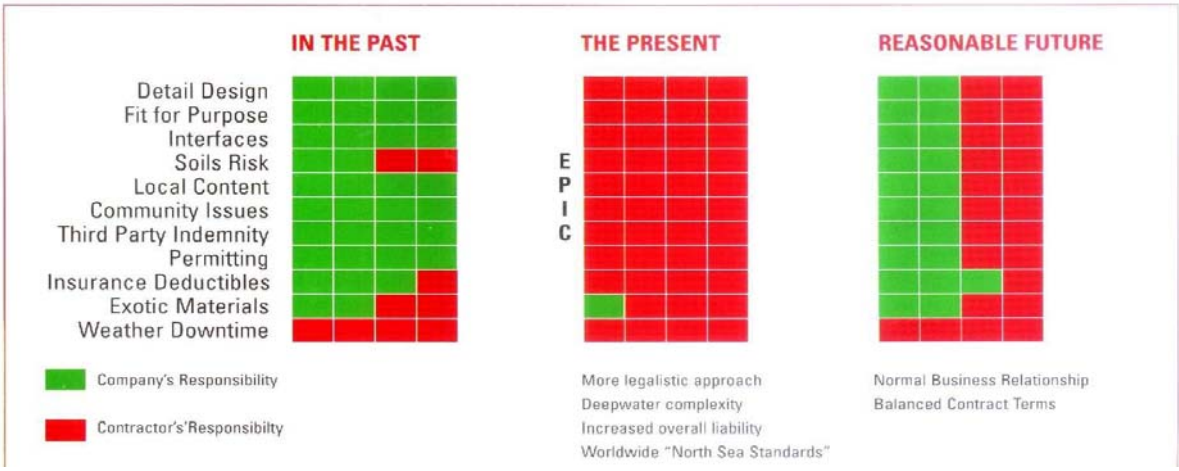

Figure 4: The diagram showing the shift in the risk profile of the EPIC contractor. Source: E Heerema

With fewer players, competition is undermined and there is a gradual loss of transparency as companies use more underhand methods of securing business, as in the case of Halliburton which is thriving on the back of US energy and foreign policy. Halliburton has received a number of irregularly tendered multibillion military and reconstruction contracts in Iraq much to the dismay of the international market. [21]

In the context of 3.1 and 3.2 above, the following analysis of the necessary conditions for success is aimed at elucidating the alignment of the clustering factors in 3.1 to the critical aspects of an UOGSC and the risks in 3.2 that need to mitigated in order to achieve success.

3.3 UOG sector necessary conditions for success and potential for failure[22]

3.3.1 Alignment of infrastructure investments decisions

An UOG fabrication hub is essentially a steel beneficiation/fabrication hub that hangs together around optimised availability, cost of specialised steel plate, and additional locational advantage infrastructure, labour. Access to appropriate finance and technology services add comparative competitiveness. The critical issue is the nature of the investments. They must be in purpose built and dedicated quayside and fabrication facilities.

South African contractors need to evolve from piece meal project driven players to continuous production driven players with the concomitant cost savings which will improve competitiveness. It is the application of engineering production process management in Singapore that has been developed into the current comparative advantage the Singaporean yards enjoy.

Any additional infrastructure (such as a ULCC capable dry dock) that can maximise the movement of steel through the cluster could have a significant impact on the success and sustainability of an UOG supply/services hub. ULCC/VLCC/VLOC repairs and maintenance and in the long term new builds would dramatically improve access of the cluster to this market and the impressive turnover projected.

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[21] See also http://www.halliburtonwatch.org

[22] This section is designed as a generic outlook with little reference to the South Africa context which will be looked at in the next section; consequently artificial lack of context may seem strange, but was introduced to meet the request of the oversight committee.

3.3.2 Transparent shared and common goals

For a cluster to be successful in the upstream, common goals are not sufficient. Shared goals cement the collaborative environment and ensure that the cluster goals are understood and incorporated into the strategic plans of the stakeholders. From a risk perspective, shared risk is mitigated risk and it is then easier to justify the corresponding reward. This is an essential aspect of the clustering initiative, which is highlighted in the context of the risk profile elucidated in 3.2. Notwithstanding any collaboration, stakeholders may well have competitive advantages that are confidential, such as proprietary technology.

Sharing information however regarding cheapest sources of steel and using combined negotiating and market power to get a better price would be advantageous to the cluster but would not detract from the technology advantage of any single stakeholder. Competition issues would have to be considered and the competition authorities involved ensuring alignment around the regulatory understanding of collaborative competition.

3.3.3 Early involvement of contractors in field development decisions

In the context of the risk profile of the UOG contractor environment outlined in 3.2 above, one mechanism for mitigating risk for contractors, especially where they have little control over the realisation of the risk, is to include them early in the decision making process. It has also been proposed that operators employ engineers to represent them so that engineering decisions are made by engineers in a spirit of equitable apportionment of risk. Early involvement of the contractors in the Front End Engineering Design (FEED) process will enable both EPIC and sub-contactors to indicate early whether they are in a position to mitigate such risk or not and to withdraw if the risk environment jeopardises the contractor beyond insurable or recoverable exposure.[23]

3.3.4 Policy Clarity – alignment of local and national interests

Every successful UOG services hub has had government intervention as a critical success factor. This has taken the form of classic free market incentive driven leverage as seen in the US market. On the opposite end of the scale, the Singaporean government established SOEs to enter the market. These have been partially or entirely privatised as market conditions allowed. Japanese and Korean governments created customs and excise environments to protect their steel industries (of which the shipbuilding sector is an integral part). The Norwegians have hybrid of these where foreign investors were invited in but had to commit to local skills transfer and employment opportunities. The resulting learn by doing experience is the foundation for a highly competitive and specialised services sector that exploits locational advantages for its own UOG sector and export services in terms of skills and technology competitiveness across the globe.

Government alignment with any UOG cluster initiative is essential, both at local level in terms of the local government incentives and national government in term of leveraging national interests in bilateral and regulatory environments. The potential synergies in this regard are indicated in the diagram below.

[23] See also: http://www.oilonline.com/news/features/aog/20050401.Consulta.17659.asp

The Figure 5 indicates the linkages for just three of the above success factors in 3.1 above and graphically show how local initiatives without national championship will not necessarily fail, but are unlikely to achieve full potential and process delays resulting from any misalignment deters UOG investors who seek responses and delivery "consistently reliable goods and services, in time, in spec and in budget". The diagram takes only three of the above clustering success factors and provides the crude linkages to success.

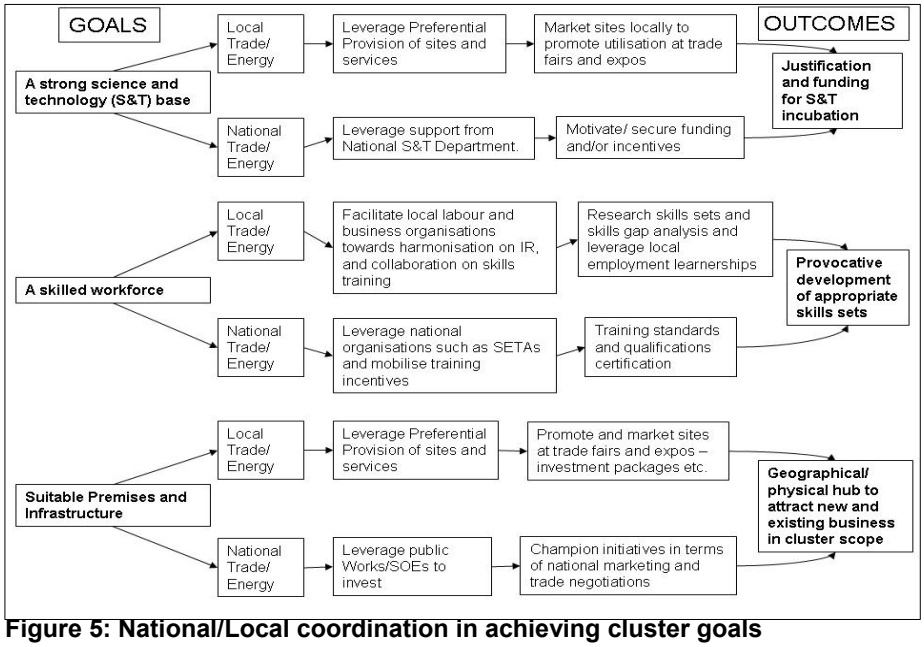

Figure 5: National/Local coordination in achieving cluster goals

3.3.5 Unhindered flow of information

UOG is highly technical and capital intensive, consequently any information and knowledge sharing in the interest of the industry as a whole will promote clustering from both an efficiency and competitiveness perspective.

In Houston, Aberdeen and Stavanger, a critical success factor has been the collaboration around research and development and the joint promotion of innovation hubs that provide innovative technology breakthroughs for the hub. In Singapore, the manufacturing industry has recently developed a dedicated research institute at a Singapore university to promote its innovation efforts. Such collaboration is not dissimilar to the current mining engineering centre of excellence at Wits University, where the Chamber of Mines constantly promotes innovation (often through providing research funds) in the interest of the mining sector as a whole.

Successful cluster and the leverage used to facilitate them

US (GOM) – domestic oil and gas resources and US government promotion of the industry,

Norway/UK (North Sea) – domestic oil and gas resources and significant government leverage of local content and employment opportunities,

Singapore – locational advantage with regard to international trade routes (especially crude oil) and a primary shipping sector and significant state involvement in the sector through SOEs in the first instance. The key upstream fabrication yards are all privatised SOEs,

Japan – has protected and promoted its steel industry for more than fifty years (shipyards, motor vehicle manufactures and heavy engineering) and today the shipbuilding and fabrication sectors are globally competitive,

Korea - has protected and promoted its steel industry for more than fifty years (shipyards, motor vehicle manufactures and heavy engineering) and today the shipbuilding and fabrication sectors are globally competitive - one could argue that the Korea-Japan-China axis forms the worlds largest and most competitive heavy steel engineering cluster,

Dubai – the UAE have an almost absolute location advantage, but the kingdom of Dubai has benefited form a benevolent monarch with foresight that committed billons of US dollars over the past 20 years in developing a purpose build and dedicated shipbuilding and repairs and maintenance hub with significant topside fabrication capacity and competence which is globally competitive

3.3.6 Alignment of regional trade goals with the UOGSC strategy

Where a cluster has very little absolute competitiveness (such as a natural resources sector or absolute locational advantage) to leverage investments into a UOGSC, most of the leverage will be by comparative and the comparison will be with other sites that have primarily natural resources and subsequent locational advantages. In some cases dedicated facilities are, or are being, established and investments in port infrastructure are bolstering investor confidence and improving the comparative competitiveness of the host countries.

With the added local content requirements becoming common today, the only way to get access to this market will be to appeal to the host countries within regional or bilateral trade negotiations context to engage in innovative applications of local content requirements through associated relationships with the developing clusters facilities that do not undermine the host UOG activities.

Quite simply this is basic comparative competitiveness economics, where the principle is do what you do best, or could do best and let other do the rest. Build on primary competences or competitiveness and exploit the achievement of the necessary conditions for success that tip the comparative scales in the cluster's favour.

3.3.7 Conditions suggesting potential for failure

- Absence of common and shared goals – self explanatory in terms of 3.3.2 above
- Absence of unhindered flow of information – self explanatory in terms of 3.3.5 above
- Absence of trustworthy or collaborative behaviour – a chain is only as strong as its weakest link and any suspicious or obstructive behaviour will undermine the trust of all other stakeholders
- Absence of obvious strong leadership/championship (person/team or outsourced entity) – where risks are high and caution leads to inertia or inaction, a dynamic and passionate leader will always help to galvanise action. This type of leadership has a 'sell by date' as the same passion can become disruptive where a more pragmatic approach is required as the cluster becomes more cohesive and needs less leadership and more organic direction.
- Adversarial behaviour – the essential balance in an UOG cluster is between collaboration and competition – where competitive behaviour is perceived to be adversarial, it undermines the collaborative aspect and ultimately undermines the clustering potential
- Absence of fair allocation of risk and reward – this is dealt with in 3.2 above, and with exceptional risk being forced on contractors where the mitigation of the risk is beyond the control of the contractor. This risk transference does not stop contractors taking on work, but it does incentivise them to transfer as much risk to the next level of subcontractors. It is this incentive to transfer risk and not share it that promotes anti-clustering or adversarial behaviour

3.3.8 Success can not be prescribed and failure cannot be predicted

An important understanding of the necessary conditions for success analysis is that the presence of either success or failure factors does not guarantee either success or failure respectively, but rather the absence of success factors or presence of failure factors should be perceived as serious risks to the success of a clustering initiative.

These major risks need to be dealt with as priorities before more refined initiatives are implemented. One can request various parties to find risk mitigation strategies which will make an initiative more attractive, however, no matter how the 'feel good' reports provide strategic solutions, the risk remains until action is taken to mitigate it.

4 Conditions that need to be sufficiently aligned for success

The sufficient conditions for success are those that once the necessary conditions for success have been achieved, are sufficient to leverage clustering options to varying levels of success depending on the critical mass of sufficient conditions that are achieved and whether they are optimally aligned.

The sufficient conditions for success can be related to overcoming cost inputs to the cluster, or aligning policy decision making in order to leverage policy that is investor friendly and to create an investor friendly environment that addresses investor concern directly and provides comparative advantages for investors that make the Western Cape the location of choice for UOG investments.

4.1 Global conditions summary

These sufficient conditions for success need to be considered within the global environment where certain generic conditions exist, that impact on UOG investments world wide. Some of this have been mentioned in the introduction, but for the sake of continuity are summarised here:

i) Global oil an gas prices increases/fluctuations are driven by:
    a. by increased real demand from China and India in the context of the past 10 years of sustained double digit economic growth in China
    b. Rapidly worsening supply capacity constraints - under investment in UOG upstream over past 20 years – impact of NOCs
    c. Global mismatch in terms of types of crudes available and the refining capacity available to refine them
ii) Peaking production and insufficient replacement requires more risky frontier E&P - deep water, regional geopolitics but high global oil prices are making marginal frontier projects more attractive
    a. Complex projects – efficient management of cash flow and risk (see Appendix 6 and 6)
    b. Increasing reliance on more expensive technology – ROVs (cost) and 'untested' project specific innovation (risk)
    c. Significant first mover risk in an unpredictable global/regional geopolitical climate
iii) Collaboration/mergers to exploit synergies
    a. Market concentration to achieve efficiencies and production economies of scale
    b. Clustering to achieve synergies of competitive collaboration,
iv) Growing shortage of labour/skills - employability/mobility, where fluctuating demand for labour due to the unstable fortunes of the UOG sector resulting in firstly attrition of skilled workers to more secure alternative sectors and the concomitant aging of the remaining labour force.
v) Bilateral trade negotiations that deliver exclusive counter trade commitments where large powerful coming nations leverage such agreements form weaker producing nations, often to the detriment of regional trade synergies.

The following analysis of conditions that need to be sufficiently aligned to successfully attract investors should be considered in the light of the above generic global UOG conditions precedent and it should also be noted that the distinction between 'necessary' and 'sufficient' conditions for success may be academic and in reality there is often overlap as indicated below.

4.2 Cost related conditions that need to be sufficiently aligned to attract investors

i) Comprehensive Steel costs
    a. Quality (failure risk), price (cash flow risk) and reliability of supply (delivery risk)
ii) Cost of Capital – WACC, DCF and ROI
    a. Materiality from a global portfolio perspective – absolute vs. comparative

competitiveness

iii) Utility costs
   a. Electricity (SA Cheapest), water (SA competitive – WC is not), steam (Coal and Electricity cheap – but WC not the cheapest) and gases (prices market driven and commercial arrangements can leverage better prices probably from Afrox, the monopoly gas supplier)

iv) Labour costs
   a. Supply – global shortage is pushing costs/overheads up
   b. Skills – appropriateness and employability
   c. Productivity – industrial relations and work ethic
   d. Reliable Quality – on time and on spec – risk of post production failures due to poor quality control will be discounted as a risk premium on competitiveness

4.3 Policy related conditions that need to be sufficiently aligned to attract investors

i) Infrastructure development risk
   a. National championship – SOEs (NPA and PetroSA) decide on these investments, therefore state championship can leverage such investments
   b. Supporting logistics – essentially transport related – competitive sea, air, road and rail – alignment of cost, efficiency and reliability – consistent reliability premium paid by contractors can be significant

ii) Country risk
   a. Geopolitical – domestic and regional and regulatory harmony, especially where different cluster components may be located in regionally where different regulatory requirements persist
   b. Any regulatory requirement that unreasonably hinders 24/7 operations will become a comparative disadvantage.

iii) Trade and Industrial Policy
   a. Counter trade credits/local content harmonised with project viability
   b. Import and export regulatory harmony/synergy – tariffs, customs and excise etc.
   c. Local/national incentives harmony – rates/taxes etc.
   d. Incentivised centres of excellence/innovation hub(s) – Chamber of Mines invests in Wits Engineering Faculty and entire mining industry benefits.

iv) Fiscal Policy
   a. Tax and Royalty regime/synergy

v) Monetary Policy
   a. Currency risk

4.4 Investment related conditions that need to be sufficiently aligned to attract investors

i) Infrastructural Advantage
   a) Purpose built and dedicated port infrastructure and subsequent cost of leasing and/or purchasing back of port real estate.- more comparative (i.e. competitiveness can be leveraged directly) when considered in the light of development in other centres such as Angola and Nigeria that are using a carrot (incentives) and stick approach (local content requirements)

ii) Locational Advantage
   a) UOG trade and backhaul (tankers in ballast) routes - more absolute (i.e. competitiveness must be leveraged indirectly), as one cannot change ones locational advantage or disadvantage, it can only be off-set by other advantages such as having dry dock facilities that exploit a minor locational advantage to make it comparatively more attractive

iii) Geopolitical Advantage
   a) Risk profile or more commonly regarded as country image - more comparative –

Ireland managed to convince investors that the war in Northern Ireland (only 160km to the north of Dublin) was not a risk.

iv) Climatic Advantage
    a) Productivity - number of optimal work days - more absolute, however one could make comparative interventions that make a climate disadvantage (rain) less severe by incentivising the construction of additional warehouse space with sufficient high and floor pace to fabricate large PAUs under cover.

v) Policy Advantage
    a) Investor friendly environment to attract and retain – almost entirely comparative as policy can be changed to attract investors in almost any situation it the national interest is seen to be served

vi) Cost Advantage
    a) Steel, utilities, labour and services - more comparative as government (utilities), labour and the private sector (services) can negotiate to promote an investor friendly environment thus providing a collaborative position to convince investors of a commitment to long term stability.

vii) Technology Advantage
    a) Centres of Excellence/Collaborative Innovation Hubs – comparative as government can incentives these centres or hubs by levering private investments or simply funding them directly as has been achieved with the innovation hub between the University of Pretoria and the CSIR.
    b) Skills and Knowledge Transfers - more comparative, as government can simply demand local employment opportunities (with training commitments) as was achieved in Norway and Malaysia.

5 COGSI, the status quo

Rationale: The African west coast is a gas province and critical mass of services is win-win for local E&P and export of services to West African exploration, field development and production. This could be linked to a concerted effort from the Western Cape to promote the mandate of the National Oil Company (PetroSA) to obtain farm-in rights throughout west and southern Africa which would then be used to leverage export of services accordingly.

Currently 32.3% of West Africa's and 23.7% of the Middle East's crude exports (amounting to approximately 249 million tonnes in 2004)[24] pass the Western Cape[25], which provides additional synergies from a shipping services perspective. This equates to an annual movement of 800 to 1000 VLCCs and ULCCs[26] following shipping routes around the Western Cape.

In addition, revamping Saldanha to receive VLCCs and ULCCs would introduce the possibility of allowing VLOCs to use Saldanha for iron ore and other minerals export, along with the associated repairs and maintenance possibilities.

There could also be possibilities for DTI procurement off-set credits being used to leverage development fabrication facilities and interest has already been expressed by some off-set investors.

5.1 Market segmentation

As pointed out in the COGSI business plan, the four market segments of the UOG sector are: exploration, appraisal, field development and commissioning/production. Each of these sectors can be subdivided in terms of the supply chains that feed into them as follows:

Figure 5: Schematic of the E&P process

SEISMIC, R&D & DRILLING SERVICES	DRILLING SERVICES	NEW BUILDS/ FABRICATION – (SURFACE/SUBSEA) CONVERSIONS/	UPGRADES/ CONVERSIONS
EXPLORATION ⇨	**APPRAISAL ⇨**	**FIELD DEVELOPMENT ⇨**	**COMMISSIONING/ PRODUCTION ⇨**
Provisioning Services/General Engineering Supplies/ Repairs/ Maintenance	Provisioning Services/General Engineering Supplies/Repairs/ Maintenance	Provisioning Services/General Engineering Supplies/Repairs/ Maintenance	Provisioning/ General Engineering Supplies/Repairs/ Maintenance
Per field related costs **USD 50 – 100 million**	Per field related costs **USD 100 – 200 million**	Per field related costs **USD 1.5 (deep) – 3.5 (ultra deep) billion**[27]	Per field related costs **USD 100 – 400 thousand/day**

[24] EIA map of energy trade

[25] In this regard, the ports of Cape Town, Saldanha and Coega are clustered from a global supply chain perspective and any one could have locational advantage from an investment perspective.

[26] Using an average of 250 000 dwt as the lower limit and 350 000 dwt as the upper limit in order to spread the loads between VLCCs and ULCCs, although VLCCs are the more abundant transport mode.

[27] These costs represent new builds - conversions and upgrades can cost up to 40% less as the critical cost driver is the price of steel.

In appendix 5, the INTSOK value and supply chain is very well itemised and unambiguously points to the level of activity and coordination of supply chains required during field development to ensure deliver of constantly reliable goods and services in time, in spec and in budget. This can also be cross reference to the field development decision nodes in Appendix 6 and the cash flow during field development in Appendix 7. The purpose behind focusing on the three schematics is the graphic illustration of the critical management skills required during field development. These include:

- project management from an engineering perspective to coordinate the timing construction (at multiple location world wide) and installation (at the field) activities,
- financial management skills to ensure budgetary control and finally,
- excellent risk management to limit the importation of risk and subsequent delays when accidents or failures happen.

From an African west coast perspective, these skills are generally supplied by global EPIC contractors who subcontract smaller orator opt deliver various components or PAUs for integration in the final instance.

5.2 Analysis of the African west coast fabrication activities

The purpose of this table is simply to provide a broad overview of the types of services being supplied in the West African environment and who the key EPIC contractors are. FPSOs have been isolated as they are the second most numerous additions to the upstream asset stock over the next 10 years with 40% of the FPSO new builds worldwide going to west Africa and 17% of the total surface new builds being FPSOs for west Africa.

However the most numerous number of projects remain the fabrication of jackets and the EPIC contractors generally appoint a myriad of smaller engineering contractors to complete various aspects of the project. These are generally focused on the fabrication of PAUs, but in Nigerian case some of the integration is done at the local yards and transported off shore for hook-up.

Table 6: Analysed from the West Africa developments to date

Contract	Work spec	Value (USD)	Location	Key Cost Drivers	Key players – EPIC contracts[28]
FPSO Hull	Engineering, building and commissioning of the hull	400 -700 depending on size and, if a conversion, the amount of additional steel required	Yard and dry dock	Steel, Labour	Hyundai, Matsui, Samsung, Hitachi, Keppel, SembCorp, Daewoo, Bechtel
FPSO Topside	Work scope usually encompasses fabrication and assembly of PAUs, installation, hook-up and commissioning of the topsides facilities as modules, typically including a flare tower and a mooring support	300 – 500 depending on the spec (and corresponding amount of steel and level of innovative engineering) for the topside e.g., how many booms, helipad, nature of	Yard and/or dry dock, depending on the nature of the work – conversions are best done in a dry dock so that heavy engineering and	Steel, Labour, Utilities and if integrated at a different site, Transport	ABB, Technip-Coflexip, Keppel, SembCorp (SMOE) Halliburton, Aker Kvaerner, McDermott-ETPM West Inc (MEWI), Saipem, Bouygues

[28] Mergers and acquisitions may mean that some of these key players are in fact on and the same, for example, ETPM is now part of the SAIPEM group. The scope of this project did not allow time to make a detailed analysis of the exact ownership situation.

	structure, helideck etc	processing units, type of mooring system etc.	fabrication can be carried out in parallel. Small amounts done at local yards		Offshore SBM
Fabrication of jackets	General and heavy engineering to prepare PAUs and modules for surface aspect of field development	10 -100 depending in the depth and environmental conditions	Global/regional and local yard fabrication/ integration followed by on site installation	Steel. Labour, Utilities, and (if integrated at a different site) Transport	Heerema, Bay Ltd, Saipem, Bouygues Offshore, AMEC, SA Five Engineering
Subsea (Oil)	The work scope usually encompasses project management, engineering and the supply of manifolds, trees, wellheads, controls, connection systems, intervention equipment, integration testing and installation support.	100 – 300 depending on the number of wells and depth of the water	Global and local yard fabrication followed by on site installation	Steel, Proprietary technology Labour, Utilities and (if integrated at a different site), Transport	ABB, Subsea 7, Stolt, FMC, Expro, Cameron, Dresser-Kellogg
Subsea (Gas)	Contract can cover design engineering, procurement, installation and commissioning of the gas-export pipelines, production flowlines, water-injection lines and steel catenary risers.	100 – 300 depending on the number of wells and depth of the water	Global and local yard fabrication followed by on site installation	Steel, Proprietary technology Labour, (and if integrated at a different site), Transport	ABB, Subsea 7, Stolt, Expro, Cameron

5.3 COGSI's current position

COGSI faces specific conditions, but cannot escape the generic cluster necessary conditions for success which do not show a 'happy' COGSI at this stage, as indicated below:

Clustering success factor	**COGSI**	Clustering success factor	**COGSI**
A strong science and technology base	😐	Entrepreneurial culture	😐
A growing company base	☺	Ability to attract key staff	😐
A skilled workforce	☺	Availability of finance	☺
Suitable Premises and Infrastructure	☹	Effective Networks	😐
Business support services and large companies in related industries	😐	A supportive policy environment	☹

Source: Development Agency for North East England

Various studies have identified a number of comparative advantages that South Africa has in this regard. These include:

- ☑ Proximity to the west African upstream E&P,
- ☑ an established downstream petroleum sector that has service supply synergies with the initiative from an engineering, IT and skilled labour perspective, and
- ☑ The existence of a number of top end engineering projects (Mossgas – now PetroSA and

the Mozambique gas pipeline) over the past 10 years that have consolidated an fledgling fabrication and repairs and maintenance industry. the

- ☑ Proximity to the current supply routes used by the global fleet VLCCs and ULCCs

Having outlined the generic UOG necessary conditions for success, then sufficient conditions for success and the global and regional conditions in terms of who are the main players, what activities are involved and what broad market opportunities exist. The next step is to asses the COGSI initiative in terms of how much has been achieved towards creating the necessary conditions for success and how well the conditions sufficient for success are aligned from a comparative perspective.

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
Necessary conditions for success					
Alignment of infrastructure investments decisions	HIGH	LOCAL: The launch of COGSI, notwithstanding the ensuing tension, has elevated the UOGSC initiative onto the national agenda COGSI business plan has already identified this condition for success	PGWC/COGSI needs to play a more decisive and proactive role on the OGTT – share and exploit first mover advantage and leverage championship of COGSI and the infrastructure investments needs to support the cluster	An urgent and thorough analysis of the comparative advantages that the Western Cape can exploit and detailed competitiveness analysis of the COGSI initiative	Comparative advantages are dynamic; therefore the timing of interventions is critical to achieving first mover advantages. Commercial realities dictate the pace at which COGSI must generate clustering interventions however COGSI has to stay ahead of the market, and any loss of first mover advantage will undermine COGSI's ability to harness collaborative momentum and associated critical mass

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
	CRITICAL	NATIONAL: COGSI business plan has already identified this condition for success COGSI business plan provides a very comprehensive resource for challenging all domestic stakeholders on the investment opportunities in COGSI	Whilst the COGSI business plan and subsequent workplan for the clustering activities is strategically sound, the PGWC broader sectoral strategy as to how COGSI fits into the broader national UOGSC initiative is far less obvious	Catch 22 – investors need infrastructure commitments to trigger back of port fabrication investments; however SA has a very poor competitiveness (NPA report) rating in terms of the major income generating activities such as fabrication and refits, which in turns makes NPA uneasy about the investment in infrastructure.	There appears to be a disjuncture between national political imperatives and national decision makers within the Transnet Group. Transnet decision makers have access to powerful political policy makers and any disjuncture between Transnet and National interests will result in inertia, bad timing and loss of first mover advantage in a highly competitive sector NPA needs to leverage maximum utilisation of Coega and may be persuaded to locate its resources to developing the back of port infrastructure at Coega.

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
	CRITICAL	REGIONAL: COGSI business plan has already identified this condition for success No apparent achievements have been made	COGSI business plan relies specifically on the need for NEPAD leverage of access to regional UOG markets and to date this aspect does not seem to have been prioritised in terms of bilateral or regional trade negotiations	COGSI has either assumed or relied on the OGTT to address this aspect. The is not an unreasonable situation, except that the OGTT seems weakened in terms of 'commitment fatigue' and capacity constraints that have delayed the adoption of the Terms of Reference of the OGTT. COGSI needs to engage with the DTI and DME in this regard to fast track the political interventions from a NEPAD and bilateral trade negotiation perspective	Local content initiatives in all African west coast oil producing nations have leveraged significant commitments from operators and EPIC contractors in terms of infrastructure investments and training and skills transfer programmes to the exclusion of any significant South African involvement. Investments in infrastructure are not frictionless and any misallocation of resources in this regard will create significant barriers to exit for investors and to entry for any late movers – regional trade partners have to be convinced of the long term astuteness of spreading the supply services and engineering solutions throughout the region to achieve optimal efficiency from a comparative analysis perspective.

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
Transparent shared and common goals	CRITICAL	Institutional relationship Development within the commercial sector is progressing well Local stakeholders are excited about the [prospects although they are more circumspect about the outcomes.	PGWC is perceived as 'running ahead of the pack'. PGWC needs to be more transparent in its planning and high-level interventions to avoid 'surprising' other stakeholders	PGWC/COGSI needs to play a more decisive and proactive role on the OGTT – share and exploit first mover advantage and be seen as 'running within the pack'	Other initiatives leverage 'political' championship away from COGSI, such as the KZN Initiative
	HIGH	COGSI database of over 500 companies expressing interest n the cluster initiative	COGSI's necessary independence as the cluster promoter is undermined by close relationship with PGWC, especially in the context of the adversarial developments between PGWC and NPA.	OGTT has to be the strategic forum for championship of the UOGSC, whist COGSI has to be recognised as the geographical output of that strategy.	NPA, national government and PGWC all seem to be talking the same language, but acting independently.
Early involvement of contractors in field development decisions	HIGH	LOCAL/NATIONAL COGSI database of over 500 companies expressing interest n the cluster initiative	Not clear at this stage	PGWC needs to promote a broader entity than the OGTT to coordinate UOGSC outputs, or promote extension of the OGTT on a regular basis to bring in private stakeholders – every 3rd month?	Contractors will take on unacceptable risk which results in failures and delays which undermine the image of South African companies from the perspective of the UOG standard of delivering constantly reliable goods and services in time, in spec and in budget.

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
	CRITICAL	REGIONAL Field development decision making takes place beyond the control of the SA contracts an COGSI needs to urgently establish a working relationship with other organisation representing contractors	Delays in getting COGSI marketing of the ground and capacity shortages mean these time intensive activities are currently deprioritised to make sure the marketing is aligned with available service offers	A regional UOG investment summit under the auspices of the NEPAD if appropriate	Local content initiatives in all African west coast oil producing nations have leveraged significant commitments from operators and EPIC contractors in terms of infrastructure investments and training and skills transfer programmes to the exclusion of any significant South African involvement.
Policy Clarity – alignment of local and national interests	CRITICAL	COGSI business plan has already identified this condition for success PGWC has correctly recognised the need to exploit first mover advantages in a competitive sector.	Tension between COGSI and NPA Limited consultations have exposed an alarming dynamic whereby an national upstream supply initiative is perceived as having been 'hijacked' by the local and provincial authorities in the Western Cape	Lack of coherent national support for COGSI detracts from the necessary statement of intent a national government minister could give from a global perspective. PGWC needs to appoint a dedicated negotiator for six months to resolve this and get the infrastructure strategy aligned with the market needs. **Six month window of opportunity**	COGSI, as a PGWC initiative, is caught in the middle and has to woo investors on sound and transparent commercial criteria, whilst being kept on a fairly tight political leash. Any delay in implementing the COGSI mandate will disadvantage the western cape in relation to developments in west Africa.
Unhindered flow of information	HIGH	COGSI business plan provides a very comprehensive resource for challenging all domestic stakeholders on the investment opportunities in COGSI The COGSI Newsletter should	Commercial players seem unwilling to share vital data necessary to fully assess the competitiveness and comparative advantages that need to be promoted	Establish an UOG industry association to coordinate the collation of commercially sensitive of information and generic industry indicators	Clustering requires sharing of industry wide information in order to make interventions that will offset competitive disadvantages by intervening and promoting comparative advantages and appropriate interventions

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		provide a regular mouth piece for the initiative			
Alignment of regional trade goals with the UOGSC strategy	CRITICAL	none	COGSI seems complete excluded from bilateral and regional trade negotiations	Globally, trade negotiations involve the private sector associations in order to ensure alignment of techno-economic imperatives with trade promotion	The COGSI strategy is virtually hinged on the ability to leverage trade advantages from NEPAD networks and trade negotiations NEPAD fails
Sufficiently aligned cost related conditions for success					
Comprehensive Steel costs	CRITICAL	For fabrication, harmonisation of the Steel price and NB the quality – National government has initiated discussion with Mittal Steel (formerly Iscor) in this regard	Misalignment of local and national imperatives	Provincial Government could lobby for reduction or removal of tariffs for fabrication in the sector.	Continued import parity pricing is anti-competitive and undermines the competitiveness of South African fabrication efforts
Cost of Capital – WACC, DCF and ROI	UNCLEAR	Insufficient information	Insufficient information	Insufficient information	Insufficient information
Utility costs	HIGH	SA is one of the lowest cost electricity generators	Western Cape has some of the highest electricity tariffs in South Africa Western Cape has a high drought risk that could place constraints o water supply	PGWC and COGSI need to urgently address the monopoly position of Afrox in the Western Cape in terms of the supply of LPGas and other industrial gasses. Such gasses have utility status in terms of the volume used in steel fabrication hubs.	Future capacity investments force a stepwise increase in electricity prices making energy intensive industries uncompetitive – a steel based cluster would fall into this category. AFROX secure an exclusive supply agreement for Ibhubesi gas, thus stifling competition in the bulk gas market.
Labour costs	HIGH	LOCAL/NATIONAL COGSI business plan has already identified this condition for success.	DHA will be essential in smoothing the way for importing labour in the first instance. Failure to include the DHA early on may result in bureaucratic delays beyond the control of COGSI	National government has launched supplier development initiatives in the downstream that could have synergies with the COGSI initiative	Domestic skills development fails to deliver required skills on tome expensive imported and scarce local labour undermine the competitiveness of the COGSI initiative

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		REGIONAL From a regional coordination perspective, achievements have been dismal	Global shortage of appropriately skilled labour means that COGSI stakeholders will already be competing with west African stakeholder for the same labour	Use SETAs to start prepping skills training as matter of urgency in order to pre-empt the skills shortage and be able to promotes availability of suitably qualified labour as a comparative advantage making the COGSI competitive	Drastic labour shortage pushes up the price of labour and generating a regional labour crisis that could result in serious delays that undermine all stakeholders resulting fabrication work reverting to established global players yards of choice
Sufficiently aligned policy related conditions for success					
Infrastructure development risk	CRITICAL	COGSI business plan has already identified this alignment for success.	COGSI's necessary independence as the cluster promoter is undermined by close relationship with PGWC, especially in the context of the adversarial developments between PGWC and NPA	NPA has critical role to play – PGWC can leverage alignment through national government – DPE is the shareholder Investments in port infrastructure by NPA would provide comfort to fabrication and service supply investors that the commitment by the national government mitigates long term country risk	There appears to be a disjuncture between national political imperatives and national decision makers within the Transnet Group. Transnet decision makers have access to powerful policy makers and any disjuncture between Transnet and National interests will result in inertia, bad timing and loss of first mover advantage in a highly competitive sector NPA needs to leverage maximum utilisation of Coega and may be persuaded to locate its resources to developing the back of port infrastructure at Coega.
Country risk	HIGH	Recent high profile mega projects such as MOZAL, the Mozambique Natural Gas project and the PetroSA gas filed and GTL benefaction	Continuing instability in Zimbabwe ad DRC create a serous misconception of the stability of the region which undermines South Africa's	It the Irish development agency can convince investors to invest in Dublin, one hundred and sixty kilometres south of Belfast during the	Global economic slow down causes a drop of in demand fro crude and marginal or risky frontier E&P plans are put on hold, resulting in stranded

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		plant have provided useful exposure of south Africa to the international community in terms of the stability in the region	comparative advantage of being the 'big safe bet' in southern Africa.	height of the northern Irish troubles, then PGWC, COGSI and WESGRO should be able to convince investors that Zimbabwe, 2000 kilometres to the north is not a threat!	assets in the fabrication hub.
Trade and Industrial Policy	HIGH		National government already has the IDZ model and therefore better to start by intimating negotiations with DTI for IDZ registration/licence than trying to get concessions from scratch	MOUs with IDC, DBSA etc – PGWC can leverage these MOUs	
Fiscal Policy	CRITICAL	No achievements at this stage	SARS do not appear willing or able to address the shortcomings of the current customs and excise regulations that make 24/7 operations impossible as fabrication and repairs operations cannot involve 'after hours' 'export' or 'import' of items at this stage Daily opex can run into hundreds of thousands of US dollars and a day or two delay due to regulatory bureaucracy will simply result in diversion of urgent repairs to other centres	COGSI needs t urgently set up negotiations with SARS. The assumption is that the representation of SARS on the OGTT would resolve this, however SARS have not been attending OGTT meetings since late 2004, Direct negotiations may be more appropriate	The hassle factor premium is too high and EPIC contractors seek subcontractors with more flexibility. West African authorities have shown remarkable innovation in accommodating regulatory adjustments to achieve investment and regulatory synergy. This willingness to assist investors is fast becoming a comparative advantage of west African governments that is not being followed by South Africa if current investor complaints are valid.
Monetary Policy	IMPORTANT	Tied up with country risk but also affects South African investors in back of port infrastructure and facilities Low interest rates make the cost of capital competitive and	South African manufacturing companies are currently battling to remain competitive under strong ZAR conditions.	Not much COGSI or PGWC can do directly	Internationally lower interest rates and the strong ZAR, erode the financial competitiveness for south African investors,

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		interest rates look set to remain low for a while			
Sufficiently aligned investment related conditions for success					
Infrastructural Advantage	CRITICAL	COGSI business plan has already identified this alignment for success.	The recent NPA offshore oil and gas report identifies significant risk which probably explains NPA inertia t this stage	Investments in port infrastructure by NPA would provide comfort to fabrication and service supply investors that the commitment by the national government mitigates long term country risk	Local content initiatives in all African west coast oil producing nations have leveraged significant commitments from operators and EPIC contractors in terms of infrastructure investments and training and skills transfer programmes to the exclusion of any significant South African involvement. Investments in infrastructure are not frictionless and any misallocation of resources in this regard will create significant barriers to exit for investors and to entry for any late movers – regional trade partners have to be convinced of the long term astuteness of spreading the supply services and engineering solutions throughout the region to achieve optimal efficiency from a comparative analysis perspective.
Locational Advantage	HIGH	COGSI business plan has already identified this alignment for success. Analysis in the business plan and the recent NPA report show significant	The current infrastructure is inadequate for the anticipated fabrication opportunities South Africa faces as kills shortage in critical and essential areas, such as	South Africa has other comparative advantages which could make it more competitive with European yards, namely cheaper labour, cheaper utilities	Local content initiatives in all African west coast oil producing nations have leveraged significant commitments from operators and EPIC contractors in terms of infrastructure investments and training and skills transfer

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		competitiveness when compared to far eastern and US fabrication sights, but European yards are very competitive from location perspective	specialist welders South African rail rates are uncompetitive.		programmes to the exclusion of any significant South African involvement. Investments in infrastructure are not frictionless and any misallocation of resources in this regard will create significant barriers to exit for investors and to entry for any late movers – regional trade partners have to be convinced of the long term astuteness of spreading the supply services and engineering solutions throughout the region to achieve optimal efficiency from a comparative analysis perspective.
Geopolitical Advantage	HIGH	South Africa is a stable regional power. Global 'terrorism' fears have refocused attention of companies on south Africa as a safe destination especially where staff safety is an imperative This is especially so with regard to west Africa where political instability and work stoppages result in millions of dollars in lost revenues	SA crime rates (although improving) undermine the achievement of selling SA as a safe country in terms of global geopolitical conflicts	Nothing specific	Worsening regional geopolitics or a deterioration of the tenuous peace accords in DRC and Angola augmented by the crisis in Zimbabwe could tip the scales back to sourcing EPIC service from established east Asian and European yards
Policy Advantage	CRITICAL	COGSI has achieved membership of the national government on its board, providing clear implied support	The fact that NPA is only an observer gives bad signals as to the policy/investment disjuncture.	Synergies with national government initiatives in the procurement sector needs to be identified and exploited – the Supplier Development	Inertia with the OGTT has delayed any real progress since late 2004. PGWC either has to play a

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		COGSI has identified the need to 'go national' and has been in discussions with other initiatives in this regard. A national marketing strategy is ready for implementation which will firmly establish a 'NOGSI'	Investors are not going to be impressed by the lack of tangible support for COGSI form the only player mandated to invest in port infrastructure. COGSI initiative in moving forwards is perceived to be upstaging the national initiative and the OGTT	Programme (SDP) launched by the DME and the SD Agency.	more meaningful role at the OGTT or establish firm commitments from national office bearers for support for COGSI. PGWC absence from the OGTT antagonises national decision makers and retaliatory measures delay COGSI and undermine its role in the market.
Cost Advantage	CRITICAL	Negotiations through the DTI with Mittal Steel are progressing. A positive outcome in term of relaxing the import parity pricing to fabrication contractors would be extremely advantageous. Recent information regarding Ferrostaal looking favourably at locating a large steel production and fabrication plant n Saldanha would provide competition to Mittal and reduce the logistical component of transporting PAUs from the inland engineering works to the coast	Failure to achieve steel pricing competitiveness will remain a critical shortcoming to date. A cluster initiative should be able to have the clout to pull off major negotiations such as this in order to show COGSI's stakeholders that it can deliver at a fundamental level to improve competitiveness for all stakeholders in a win-win outcome.	COGSI should do all in its power to engage with Ferrostaal and smooth the way for a positive investment decision. Mittal has no interest in the national interest and neither does Ferrostaal, so play the game and offer the best deal to get the best deal. Mittal cries national interest when its monopoly status is challenged, but gives nothing in return when its business practices fundamentally undermine the national interest	Long term lack of competitiveness with regards to fundamental cost inputs such as steel, augmented by the strong ZAR will likely result in a structural collapse of the UOG market in South Africa with a flight f capital and investors to other locations closer to the action where overall project economics are aligned with sectoral demands and hard work pays off
Technology Advantage	IMPORTANT	Recent high profile mega projects such as MOZAL, the Mozambique Natural Gas project and the PetroSA gas filed and GTL benefaction plant have provided useful exposure of south Africa to the international community in	Significant 'learn by doing' skills transfer happens with each project, however the 'down time' between project results in attrition of skills to other sectors, which often do not return as the new sector is more secure.	Compare with other projects, such as the Mozambique Gas Project where steel and fabrication companies had to be accredited. Use this knowledge to publish	American and Singaporean yards have developed competitive PAU process management tools whilst US and Norwegian firms are leaders in subsea instillations – in both cases (which have been identified by COGSI as

Conditions for success assessed	Priority	COGSI/PGWC Achievements	COGSI/PGWC Shortcomings	Gaps	Threats
		terms of the available technology		global standards and give direction for stakeholders to prepare for COGSI success.	opportunities) dedicated purpose built yards have been established in the US and Singapore

5.4 Policy Matrix – who needs to do what

The policy matrix is in Appendix 9, and outlines the possible cross cutting responsibilities and cooperation necessary to achieve a coherent and aligned policy environment for attracting investors into the COGSI initiative.

The OGTT represents the DTI's recognition of the strategic significance of a successful UOGSC initiative, both from a regional, provincial and national perspective. The OGTT will remain an essential strategic forum for the stakeholders; however COGSI will have an increasingly important role to play as the hands-on managing forum for the implementation of the initiative in the Western Cape, the logical location geographically in terms of the already mentioned competitive advantages. Whilst there should be no fundamental dispute over the strategy to pursue an UOGSC, there will always be the potential for conflict over the operationalisation of that strategy in terms of the trade-offs that have to be made between the policy, investment and commercial imperatives.

These trades-off have to be considered in leveraging commitments towards achieving the critical mass for a cluster initiative and the competitive collaboration critical to its success. From the public sector perspective, the policy matrix is simply a representation of the suggested alignment of various stakeholders and the strategic role they should each play in achieving the common goal. This particular table is indicative of what a policy matrix would look like, however once the critical components of the second report are agreed, then the relevant policy stakeholders will be consulted in detail in this regard on order to develop a detailed policy matrix.

The final thought is that COGSI faces similar challenges to other hyped initiatives with apparent competitiveness, namely "it works in practice, but does it work in theory?" clearly from a parochial perspective COGSI has all the elements of success, however from a global perspective there a serious challenges that reflect global trends to an increasingly harsh market where even a hint that a contactors will not deliver consistently reliable services in time, in spec and in budget will result in contracts being reassigned with little recourse and often significant losses.

5.5 Preliminary conclusions about COGSI

5.5.1 Dedicated and purpose built infrastructure – first mover advantage/risk

COGSI will not experience a 'big bang' start-up. Limited skilled artisans, current scepticism in the market about infrastructure developments and South Africa's competitive disadvantages in the critical fabrication sector will likely lead to an initial and low key clustering of disparate services based in the Western Cape. As the required critical mass develops the cluster will be able to justify and motivate incremental infrastructure investments that should attract 'pedigreed' stake-holders with time.

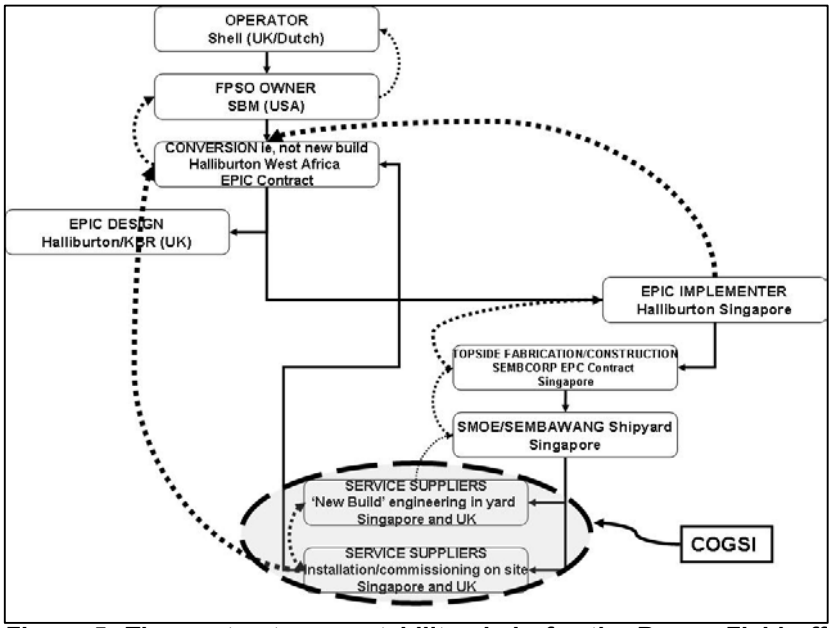

Figure 5: The contract accountability chain for the Bonga Field off Nigeria - the relative thickness of the dotted arrows relates to the risk taken by each level of contractor and how they feed back to the EPIC contractor and operator.

COGSI is near the bottom of the UOG 'food chain' (Figure 5) without a comprehensive track record in the fabrication industry (pockets of competence does not make a cluster!) and COGSI cannot build such a record, however it

can leverage the building of the track – port upgrades/revamps to provide dedicated facilities for fabrication and repairs and maintenance. The question is who will make these investments

The impression created during consultations was "Follow me, I'm right behind you" where most critical stakeholders are looking to someone else to be the first mover. First movers often experience significant risk and consequently it seems that the first mover risk (both political and commercial) is the single biggest factor causing the current inertia in the achievement of the critical mass for the COGSI cluster. Intergovernmental and PublicPrivatePartnerships would provide significant comfort to operators and EPIC contractors that they can rely on the local/regional UOG services cluster.

5.5.2 Ferrostaal on the horizon?

In contrast to this subdued prediction, the only likely 'big bang' scenario would be large investors such as Ferrostaal which is strategising its options in South Africa in terms of its defence contract offset obligations. This would be the ideal collaborative/coercive initiative that could result in a sudden large investment that would leverage long term opportunities to fasttrack the COGSI initiative and attract smaller investors resulting in rapid achievement of critical mass. The success of this option will rely heavily on the extent of the national/local alignment in maximising the benefits fro South African stakeholders. The current but unconfirmed, rumours of a ZAR 1.3 billion investments by Ferrostaal in Saldanha could provide up to a half of the critical investment mass required to kick start COGSI. It would however require NPA to come to the party to invest up to ZAR 2 billion into port infrastructure and upgrading, including extensions to the break water.

5.5.3 Policy leverage for access to contracts

Consequently the real potential to succeed in leveraging access to the smaller fabrication contracts still requires vigorous 'non-market' actions such as the use of continental (**NEPAD**) and regional (**bilateral**) **trade negotiations** as platforms to leverage coordinated access to the West African UOG sector. Large scale infrastructure developments such as dry docks and heavy engineering fabrication bases have internationally been leveraged by the joint action of government champions and large investors. This back-to-back alignment is an essential backdrop to joint commitments to invest in the port developments and consequently to use the facilities to leverage contracts in the region.

5.5.4 'New' builds or PAU fabrication central to COGSI success

What ever the outcomes of 5.5.1, 5.5.2 and 5.5.3 above, the impact on COGSI's success and sustainability will be affected one way or another as by its own analysis, the fabrication sector will be approximately half of market share in the near term, rising to nearly 80% of the market for COGSI stakeholder by the end of the decade as indicated in Figure 6. Any delay in establishing dedicated and purpose built fabrication facilities either at Saldanha or Cape Town will undermine these projections – significantly. The central issue from a competitiveness perspective is to develop such infrastructure to facilitate the transformation of South African contractors from piecemeal project driven players to efficient and competitive production process engineering companies that collaborate on generic industry competitiveness matters through the vehicle of the COGSI cluster.

Market	2005 R'000	2006 R'000	2007 R'000	2008 R'000
Supplies & Services				
%	3	5	8	8
Exploration	162	270	432	432
%	3	5	10	10
Production	160	266	427	427
%				
Repairs & Maintenance	130	162	195	195
%	1	3	5	8
New builds	420	1 288	2 062	3 912
TOTAL	**872**	**1 986**	**3 116**	**4 966**

Figure 6: Estimated market share in the UOG in West Africa

5.5.5 COGSI competitiveness issues

Thirdly, the current conditions in the South African UOG sector indicate dire threats to COGSI that are competitiveness and/or efficiency related. These relate to the current import parity pricing of steel from Mittal Steel, increasingly inefficient and aging port assets and insufficient back of port work and storage areas that are impacting on productivity and competitiveness. Alarming skills shortages and resulting risk realisation in terms of accidents, poor productivity and an increasing premium for liability insurance.

In terms of the steel pricing and supply issues, the DTI is currently engaging with Mittal and other stakeholders to resolve this matter. No feedback was forthcoming from DTI in this regard. What ever the outcome, the central impact of steel quality and prices on a steel fabrication cluster do not need explaining – however it is suffice to say that appropriate quality and competitively priced steel is a critical cost driver from a comparative perspective.

There is insufficient clarity as to whether the risk realisation is due to bad planning, a questionable work ethic or simply insufficiently skilled workers or a hybrid thereof, however the outcome is the same – accidents and delays with substantial balance sheet losses or increased insurance related costs that result in an impression that the south Africa UOG sector cannot in the short to medium term deliver cost effective and reliable solutions to turnkey projects.

However skills shortages are not parochial to the Western Cape, or South Africa for that matter, but are experienced globally due to the unpredictably of UOG developments. Consequently human resources need to be mobile and host countries need to be geared up to facilitate this mobility.

Global benchmarks for ports indicate an increasing role of sophisticated and often software driven production management techniques to achieve economies of scale and productivity improvements. These include geographically aligned processes from an engineering perspective, widespread application of electronic management systems to every aspect including logistics, fabrication, process scheduling, human resource management and project integration – often globally as indicated in Figure 5 above.

The UOG sector requires not only efficient process controls, but more broadly requires state of the art management of clusters of processes to achieve optimal productivity, risk predictability and overall competitiveness. Successful UOG supply bases are all characterised by purpose built infrastructure that is designed to integrate back of port and quayside activities in a streamlined manner that makes optimal use of real-time management tools.

South Africa is particularly weak in the planning of such complex project and globally ‘pedigreed’ consultants are used consistently for detailed engineering design. South Africa has little expertise in this regard; however local companies have achieved global recognition for more specialised engineering design on smaller projects.

COGSI’s immediate focus should be to identify the local companies in this field and seek to identify synergies and gaps in order to synthesise an ‘offer’ that could leverage initial piecemeal contracts for the Western Cape.

5.5.6 COGSI threats often beyond its control – efficiency and productivity

COGSI faces a number of risks/threats external to the initiative that have or are impacting particularly seriously on the competitiveness of the COGSI initiative. These include regulatory misalignment (such as customs regimes that are inefficient from a global perspective) currency risk, political/country risk and the loss of momentum of the NEPAD initiatives and growing unease at the lack of commitment to deal with recalcitrant political leadership that are destabilising the continent are all resulting in a ‘non-commercial’ risk premium that is seriously undermining the economics of UOG supply projects in Africa, and more especially Sub-Saharan Africa.

5.5.7 SA needs a national initiative – NOGSI?

COGSI needs to be nationalised from a strategic perspective as this will significantly reduce the country risk premium on investments. The central issue here is the need to separate out the perception that the initiative is seen to be a Cape initiative. The hub will likely be best suited to a Saldanha type environment where purpose built infrastructure can be established; however the strategic direction of the initiative needs to be elevated to a national imperative. A high-level round of negotiations needs to be convened during which the DPE, DTI and the province carve out a national plan that provides concrete national championship for the initiative with a clear national mandate for COGSI (even if this requires a name change). The current lack of clarity over national strategy and Western Cape initiatives serves only to alienate the risk averse engineering sector which has had a few bad experiences in the UOG sector.

5.5.8 IDZs – a central government clustering tool

There is however scope for anchoring the initiative from an operational perspective to the registration of an IDZ at Saldanha. An IDZ will however require substantial commitments from national government in terms of tax, customs and trade incentives to facilitate the alignment of the various investment and commercial drivers. From a bigger picture perspective, South Africa is not competitive in the global UOG sector. The PublicPrivatePartnership nature of an IDZ also demands commitments from the private sector to develop infrastructure and facilities and to use the same. For COGSI to succeed this will require a mindset shift to a true cluster where future investments are geared to the optimisation of cluster drivers such as geographical location of the various fabrication stakeholders to achieve production process efficiencies and subsequent improved competitiveness.

5.5.9 In Short

For COGSI to be successful locally, it needs to leverage structural changes to the critical value chains such as the steel manufacturing industry. Currently it is based in Gauteng close to the mines, however if investors were to be convince that the next investment (such as a plate rolling plant) should go to the western cape in support of a fabrication led IDZ then every once of leverage will be required to secure such a long term shift in investment priority from Gauteng to the western Cape. Shifting investments to the Western Cape requires conviction that the investments will be utilised and pay-off in the long run. Revamped and/or purpose built and dedicated port infrastructure will provide a ‘home’ for such investments.

Simply put, the upstream services supply cluster cannot happen without the necessary port infrastructure and conversely any investments in port infrastructure attract a huge risk of being sterilised should the cluster initiative fail to achieve critical mass (and attract the primary steel and engineering investors). In order to have a public–private partnership there must be both public and private stakeholders that share common interests in establishing a partnership – they need to want to work together! This may seem trite, but sometimes stating the obvious is in itself a sanity check or a back to basics reminder when misaligned protagonists are too close to the issue.

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MEDS Phase II Study, a Terms of Reference for the Oil and Gas Sector

Introduction

For the second phase of the Micro-Economic Development Strategy (MEDS), the Provincial Government of the Western Cape has commissioned a number of sector specific studies, one of which is the Oil and Gas sector. The study, which will comprise two deliverable papers, will be undertaken by Mr. Mark Beare (hereafter referred to as "the consultant") who has been appointed by the DEDT.

Broad Terms of Reference

A key aspect that each of the sector reports (including Oil and Gas) must fulfil is to provide the provincial government with an analysis of the current situation of the sector in the region and concrete recommendations regarding development of the sector. The study should primarily provide a broad depiction of the critical factors and the important trends which currently affect the sector in the region, with some attention given to how regional trends relate to trends at the national and global level. It must especially guide and direct provincial involvement in terms of how it should engage with the private sector and other stakeholders.

Narrow Terms of Reference

1. Provide a brief economic overview of trends in the regional oil and gas sector in the last 10 years, including a discussion of what data is available on the sector.
2. Review existing work done on the COGSI thus far. This analysis must begin with a review of the COGSI business plan and then consider other independent assessments of COGSI.
3. Review projects already underway that have been identified as complimentary to COGSI, and provide an assessment of the cost, viability, and future maintenance of these projects
4. Provide an independent analysis of the broader development potential of COGSI and other development initiatives.
5. Identify possible constraints to COGSI and other oil and gas initiatives planned or currently underway in the region that have not yet been (fully) researched and provide an analysis of what this might imply about a) feasibility, and b) implementation of such initiatives.
6. Identify any additional opportunities that have synergies or generic alignment with COGSI specifically, and how these might relate to the upstream services supply sector.
7. Make recommendations for an appropriate framework for monitoring and evaluating actual COGSI projects, including how best to deal with obtaining realistic and reliable environmental impact assessments of such projects and specific proposals regarding the infrastructure needed for monitoring and evaluating projects down the line.

Throughout the analysis the consultant is expected to address: a) skills and training requirements; b) what type of infrastructure requirements are envisaged that are not already well developed. While much of the focus in this report will be on current developments and institutions in the oil and gas sector, particularly COGSI, the consultant will identify other possible areas and projects that have the potential to contribute significantly to the economic development of the province. These will include, but not necessarily be limited to:

1. the Saldanha terminalling facilities;
2. back of port fabrication skids and related heavy engineering facilities;
3. dry dock facilities that can berth Very Large Crude Carriers (VLCCs).

The report must also make clear the pricing and labour requirements (skilled and unskilled) associated with this and other related infrastructure specifically needed for the services side of the oil and gas value chain.

Table 7: Global Upstream Oil and Gas Critical Success Factors and Essential Business Drivers

Rest of World – mature industry	Type	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
1. Fostering of competitive collaboration, which requires impeccable timing and alignment of the various stakeholders and drivers towards achievement of the central cluster goals	**CRITICAL SUCCESS FACTOR**	**Local:** HIGH - Currently, the emphasis appears to be on competitive, whilst the collaborative aspect has been neglected with regard to all stakeholders – public, private and SOEs. Evidence suggests that if the alignment is not achieved shortly, the whole UOGSC initiative could be in jeopardy. Globally, critical success factors have been identified as trust, clear and identified goals and transparent flow of information.	COGSI is too closely aligned with the PGWC and as such is immediately identified as the PGWC UOG vehicle and consequently loses its independence from a collaborative negotiation perspective. COGSI is understaffed and consequently the office of the CEO cannot keep up the momentum should there be a surge in activity that requires more hands on coordination. .	COGSI could promote its independence of the PGWC and leverage national championship in consultation with all other potential stakeholders. Unhindered flow of information has been identified as a critical success factor in international studies.
		National: CRITICAL - Currently, the emphasis appears to be on competitive, whilst the collaborative aspect has been neglected with regard to all stakeholders – public, private and SOEs. Evidence suggests that if the alignment is not achieved shortly, the whole UOGSC initiative could be in jeopardy. Globally, critical success factors have been identified as trust, clear and identified goals and transparent flow of information.	COGSI gets sidelined and national imperatives resulting policy decision that result in other CSFs not being achieved. Globally, the absence of trust and a shared goals and adversarial behaviour has been identified as a critical failure factors. Recent consultations indicate that the current relationship between COGSI and national stakeholders is regarded as lacking common direction and becoming adversarial, especially in the light of the relationship with the PGWC	COGSI needs to urgently leverage access to all of the base line studies that have been carried out both by public sector entities and private sector investors assessing their options from a strategic perspective. Especially at a national level Unhindered flow of information has been identified as a critical success factor in international studies.

Rest of World – mature industry	Type	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
		Regional: CRITICAL – the COGSI business plan strategy relies heavily on coordinating access to the upstream fabrication sector by leveraging NEPAD commitments to utilising African suppliers to build local competence and influence skills transfer.	SA has not resource advantage and its west Africa's oil that the operators and consumer nations want. This ownership of the resources provides west African nations with far greater leverage to achieve local content goals. COGSI has to work hard to engender a cooperative and inclusive environment for negotiation with 'competing' governments. National local content programs exclude SA contractors to the benefit of powerful global players who extract additional value from the region thus undermining the flow of capital to the sector which could be used to leverage infrastructure investments and training programmes.	COGSI needs to promote an axis of coordination that gains access to official delegations to the west coast region, as much politicking and commercial positioning occurs on these strips. COGSI needs to ensure that national figures with appropriate mandates are invited to attend conference and workshop, especially where other west African countries will be competing for exposure.
2. Individual supplier 'pedigree' in terms of cost, quality, reliability and safety – accreditation in all these areas is a non-negotiable for most operators when outsourcing the supply of services and equipment.	**CRITICAL SUCCESS FACTOR**	CRITICAL - COGSI needs to urgently change the perception that South Africa's competence is coincidental and develop a visible coordinated image that provides critical mass and progressive collaboration in the engineering sector.	Many operators are establishing long term contract relationships with suppliers and there is a trend to wards 'evergreen' contracts in some contexts, thus raising barriers to entry for COGSI to facilitate local involvement.	COGSI can start to promote those SA companies that have a 'pedigree' and use them as the 'bait' to attract international players with appropriate 'pedigrees' Develop and promote a transparent and globally benchmarked due diligence code of practice for accrediting investors in the UOGSC
3. The transparent development of goals and roles with regard to (1) and effective championship thereof	**CRITICAL SUCCESS FACTOR**	CRITICAL – at this stage, NPA, national government and PGWC all seem to be talking the same language, but acting independently. OGTT has to be the strategic forum for championship of the UOGSC, whist COGSI has to be recognised as the geographical output of that strategy.	NPA and national government promote an alternative location for the UOGSC. PGWC continues to pursue what is perceived to be a partisan approach to the UOGSC, without formal and high profile support from the DTI and other national stakeholders	Make sure national government is given a lead role in the SA delegation to the Offshore Technology conference in Houston in May 2005. official website, http://www.otcnet.org/2005
4. Competitiveness is driven by the price and quality of steel,	**COST DRIVER**	The cross cutting collaboration of various stakeholders in this regard has	Steel production, especially virgin steel is monopolised by Mittal (previously	COGSI is uniquely positioned to collaborate with PASA to form a 'single

Rest of World – mature industry	Type	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
cost and appropriately skilled labour and the cost of capital, consequently, trade and industrial policies, labour market stability/skills levels and fiscal/monetary policy play a fundamental role in influencing investors in the UOG sector.		stated, witness the role of the DTI in assisting COGSI and engineering firms to leverage access to appropriate decision makers at ISCOR to reassess its import parity pricing of steel into such an UOGSC. DTI alternatively has the mandate to reduce tariffs that would undermine the import parity price. ISCOR is fully privatised and as such has not justification for its tariff protection	Iscor) and import parity pricing is anti-competitive makes competitors in this sector artificially competitive due to lower cost of importing SA steel for fabrication and repairs in east Asian shipyards. Lack of regulatory harmony between trade and industrial incentives, monetary policy and fiscal incentives. the lacklustre response of investors to the implementation of the IDZ policy/incentives is evidence of this lack of regulatory synergy	window' or one-stop-shop for investors. Consider either attracting a global steel producer to the western Cape to introduce competition into the market and provide COSGI with a comparative price advantage. Alternatively look to launching a competition commission challenge to force the Mittal monopoly to abandon anti-competitive behaviour. Often careful synthesis of an investment plan augmented by marginal benefits leveraged from national government has enabled investments in the past. The defence off-sets are a typical example of this and a close working relationship between COGSI and the decision makers in this regard could have significant outcomes.
5. Level of skill (with an emphasis on multi-skilling) and relative mobility of labour force	**POLICY DRIVER**	CRITICAL – SA has already identified the shortage of Science and Technology Students in secondary education and the even worse situation at a tertiary level where hard science and technology skills are being rejected by students in search of 'soft' certificates with immediate application.	Mobility of international skills in this regard is hampered or constrained by immigration and work permit red tape. Domestic mobility of skilled labour will be important as engineering subprojects are sequenced nationally, demanding a multi skilled and mobile labour force	COGSI could promote a partnership with schools to implement an awareness campaign/career mapping initiative to expose pupils to UOG skills needs and opportunities. The same could be done at the tertiary institutions.
6. The promotion of innovation and skills/technology transfer to the developing supply cluster	**POLICY DRIVER**	IMPORTANT as there a re various incentive schemes to reward companies for these commitments. Many South Africans with experience have gone to west Africa in search of work. They can be attracted back with the right environment such as an UOGSC.	Promotion of innovation and technology and skills transfer requires significant leverage from government to elicit commitments from investors and the enforce these. Also national government is in a position to fund research and development at appropriately located universities and training institutes in this regard.	COGSI could promote the establishment of an Academy/Institute of UOG Services Supply as a centre of excellence under the auspices of the education department's skills development and restructuring programme and possibly access SETA funds.

Rest of World – mature industry	Type	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
				This could have synergy with the DME's mandate to establish the National Energy Research Institute (NERI) which has an approximately R 30 million cabinet approved budget
7. UOG demands are unpredictable and high risk, consequently risk management has become integral to UOG management processes and reducing 'imported risk' from suppliers is harshly and unforgiving implemented.	**INVESTMENT DRIVER**	HIGH – a number of recent accidents and plant failures in the petroleum and related petrochemical industries has focused attention on health and safety standards in South Africa.	Currently the supplies of goods and services into West Africa are very ad hoc and uncoordinated. Consequently there is little incentive to act collaboratively despite commitments to do so under the auspices of COGSI in the medium to long term. Foreign investors create alliances with other international investors sidelining South African stakeholders.	Certain South African firms have achieved international accreditations standards and could be the core capacity to launch the initiative. Some investors have indicated interest in investing in fabrication/maintenance projects in the Western Cape. Develop and promote a transparent due diligence code of practice for accrediting investors in the UOGSC
8. The availability of infrastructure - ports, roads, air and rail links	**INVESTMENT DRIVER**	CRITICAL - in South Africa where the NPA retains sole right to develop port infrastructure, Spoornet to develop rail infrastructure and the NRA to build roads, with approval of national government through the DPE as the shareholder and the DOT.	NPA and national government promote an alternative location for the UOGSC.	The global trend is, in the light of a proliferation of shipyards with margins under pressure, to specialise in niche markets where demand for specialised services and products exceeds available capacity. These include FPSO builds and refits and ULCC repairs and maintenance.

7 Oil Terminalling and bunkering

The emphasis would be on opportunities existing for utilising the Saldanha tank farm, with an emphasis on southern hemisphere brokering and transhipment/terminalling i.e. Shipments off-loaded in Saldanha, mixed and/or blended to destination refinery/market specifications and then redirected to other markets or bulk broken and split between say South America and Central America or other markets. Brokerage is a high risk game where well managed processes can mitigate risk, consequently a stable hub with appropriate world class support services (Legal, financing etc.).

Rationale, Currently 32.3% of West Africa's and 23.7% of the Middle East's crude exports (amounting to approximately 249 million tonnes in 2004) pass the Western Cape, which provides additional synergies from a shipping services perspective. This equates to an annual movement of 800 to 1000 VLCCs and ULCCs following shipping routes around the Western Cape en route to America and Europe.

In many global terminalling operations, the NOC had an initial role as an equity partners in a PublicPrivatePartnership. PetroSA 'owns' the assets, has a mandate to procure strategic stocks. These comparative advantages and future plans could be synergised into a terminalling hub in Saldanha. Such a hub would also provide comfort regarding security of supply.

Firstly a terminalling logistics hub would be more than simply a storage facility and would require infrastructure and skills. Infrastructure would include off-shore loading and unloading (SBM) and additional storage capacity port side. Human resource capacity would include drivers supply chain and logistics management skills, commodity trading skills and primary beneficiation skills to make the hub competitive and provide niche services to an increasingly specialised petroleum value chain.

Secondly, terminalling can include bunkering where, due to the proximity of the Western Cape to shipping lanes, ship owners and charters could be convinced to refuel and offload various types of fuel oil. Saldanha port already has bunkering capabilities, but would require additional storage infrastructure.

7.1 Terminalling activities

Terminalling would involve trading crude and refined products and in some instances, providing classic supply chain services such as breaking-bulk, trans-shipment and redistribution for the regional markets, as well as the consolidation of cargoes bound for destinations further a field.

Value added services available at a terminal might include tank-to-tank / ship-to-ship transfers, additive injection, leading, butanising, tank circulation, dye injection, tank-truck loading, micro-filtration for Jet A1 delivery, as well as complete documentation and administrative systems that ensure the compliance with various national and international regulations covering the shipment of petroleum related products.

Consequently, a mature terminalling hub can involve trading and blending crude cargoes, basic refining and blending of subsequent products to meet the specifications of customers.

Source[29]	Rest of World – mature industry	Applicable to SA – infant industry	Threat to Terminalling/bunkering	Opportunities for Terminalling/bunkering
Critical[30]	1. Terminalling:	1. South Africa is not	Crude terminalling may	A terminalling hub could

29 Various sources listed in the bibliography, namely references numbers as follows:

30 Presence of either a success factors does not imply success will be attained, and nor does presence of a failure factor imply failure in the long terms as respondents seemed to give each different priorities depending on which list (success or failure) they were assigned

Source[29]	Rest of World – mature industry	Applicable to SA – infant industry	Threat to Terminalling/bunkering	Opportunities for Terminalling/bunkering
Success factors	Proximity to refining and/or petrochemical markets	close to industrialised markets, but is close to developing and emerging markets such as Africa and South America.	not be feasible as the terminalling for the industrialised markets tends to take place in or near Europe, north America and Japan	add to the synergistic opportunities for the refineries in South Africa, where product is transported to the end user markets in Africa, South America and Australia. South African refineries already export excess production.
	2. Bunkering: Proximity to shipping lines and/or maritime transport hubs such as container transhipment hub, fishing hub etc.	2. South Africa has significant expertise in this regard with three coastal refineries involved in heavy fuel oil bunkering at the ports.	Insufficient information	Saldanha already has bunkering facilities to service the ore and crude carriers that load and discharge cargoes respectively
	3. Sufficient supply of product on the routes leading to the terminalling hub	3. Currently 32.3% of West Africa's and 23.7% of the Middle East's crude exports (amounting to approximately 249 million tonnes in 2004) pass the Western Cape,	Any supply constraints from a crude perspective. Future refining capacity is replaced with imported product, in which case that Gauteng inland region would be the market and Durban would be the most appropriate site for a terminalling operation.	Saldanha is on the 'correct side' of Africa to provide terminalling services to the industrialised markets of Europe, and the east coast of North America. From the crude oil supply routes alone, up to 1000 VLCCs or ULCCs could be serviced at a terminalling/bunkering hub
Critical business drivers	1. Deep berth offshore loading and unloading facilities for VLCCs and ULCCs	1. Saldanha does not have an off -shore SBM	Environmental concerns Port is not 'safe' and vessels are moored outside of the port in severe weather that threatens to produce heavy swell situations	An EIA has been conducted, which finds that's despite environmental concerns, stringent and enforced environmental management controls should mitigate any risk Promote the extension of the breakwater to NPA Promote installation of SBM
	2. Deep berth quayside for bunkering and refined product	2. Saldanha has deep berth facilities for both liquid and dry bulk loading and off loading	Facilities are dedicated to crude and ore handling. Refined product handling is more complicated, but more lucrative Port is not 'safe' and vessels are moored outside of the port in severe weather that threatens to produce	The Caltex refinery (or Calref) is under increasing pressure to be moved or shut down. A terminal that could handle refined product would provide an alternative to the capital cost of establishing another refinery in the short to medium term.

to. For example, trust and openness (collaboration) were most important success factors, but absence of the same was ranked third in priority behind clear and consistent goal in first place and a shared common goal in the second instance.

Source[29]	Rest of World – mature industry	Applicable to SA – infant industry	Threat to Terminalling/bunkering	Opportunities for Terminalling/bunkering
			heavy swell situations Saldanha does not have bunkering facilities	Promote the extension of the breakwater to NPA Promote installation of SBM
	3. Sufficient and efficiently designed storage for both crude and refined products.	3. Sufficient crude storage is available, but additional refined storage would be required. There is additional storage in Milnerton approximately 70km south, but the logistical cost may outweigh the option.	The Saldanha tanks do not have efficient off take mechanism which means that there is an unacceptable residual product when crude is withdrawn from storage. Environmental concerns	An EIA has been conducted, which finds that's despite environmental concerns, stringent and enforced environmental management controls to prevent soil spills and discharging of ballast into the bay would mitigate most of the risk and make a terminalling hub compatible with the ecology of the area.
	4. Proximity to VLCC and ULCC repair and maintenance yards to exploit synergies with bunkering and ship repairs, especially for vessels in ballast	4. Saldanha does not have dedicated and purpose built ship repair and maintenance infrastructure that can accommodate VLCCs and ULCCs	NPA decides to direct investments in ship repair infrastructure to another port such as Coega VLCCs and ULCCs in ballast could be redirected through Suez, reducing demand for services in Saldanha	Saldanha already has bulk cargo handing and bunkering facilities.
	5. Appropriately skilled /trained labour to fulfil the variety of functions outlined above.	5. South Africa has sophisticated pipeline operations and laboratory services	Recent and future pipeline developments may increase demand for terminalling staff which could have operational and cost implications	Petronet is ambitious to become the primary terminalling and blending operations manager in South Africa.

8 Supplier Development – building capacity – entrenching empowerment

8.1 Background

Traditionally, the private sector components of the petroleum (or oil and gas) value chain operated as a closed shop (broad border in table above) where the barriers to entry were maintained through various exclusionary tactics. The signing of the Liquid Fuels Carter in 2000 and its subsequent inclusion to the Petroleum Products Amendment Act 2004, which commits all the petroleum sector players to achieving a 25% equity stake throughout the value chain by 2010, as changed all that.

The old exclusionary tactics of the past are now under scrutiny. These included 'secret' contracts where the selection criteria were not made public, 'old boys clubs' of procurement managers and high capital barriers to entry where capex or collateral were demanded to keep 'outsiders' out.

This resulted in the concentration of skills and capital, largely excluding HDSAs. Consequently, the DME embarked in an investigation to 'unpack' the procurement supply chains and to identify way to leverage access to the lucrative procurement contracts for HDSAs. The investigation indicated that 'outsiders' can be divided in to three primary categories:

i. Capacitated and resourced – the low hanging fruit' that simply needs leveraged access to the contracts and selection criteria.
ii. Capacitated, but not resourced – need capital i.e. leveraged commercial solutions
iii. Uncapacitated and unresourced - need training and incubated commercial start-ups.

To a large extent, the ranking of the categories relates broadly to short, medium and long terms goals. The conclusion was that a dedicated programme needed to be implemented to address these critical barriers to entry for newcomers. Consequently, the Supplier Development Programme was developed to elucidate the fundamentals of the access to procurement contracts within the South African petroleum sector.

8.2 Supplier Development Programme

This process culminated in the launch of the SDP and the signing of a Declaration of Intent by the oil industry and the DME to investigate the establishment of the SDA. At the BEE Procurement Workshop held at the Cape Town International Conference Centre on the 2nd April 2004. The Minister of Minerals and Energy, Ms Phumzile Mlambo-Ngcuka, addressed the workshop and placed the establishment of the SDA on a fasttrack implementation process.

The supply and procurement of services has therefore been identified as the most likely secondary sector where the most favourable environment for smaller operators and more competitive distribution of players can stimulate commercial start-ups and investments in plant and infrastructure that could result in employment and economic growth outcomes that would address the policy intervention imperatives, namely;

i. Globally competitive, equitable and sustainable economic growth with the triple bottom line firmly embedded
ii. Enhanced labour absorption capacities – which target specifically the unskilled and semi-skilled segments of the labour market.
iii. Economic development with equity, poverty reduction and skills development embedded in the policy framework, programmes and projects.
iv. Targeted support for broad based inclusion and economic empowerment of youth, women, SMMEs and BEE in the formal sector of the economy.
v. Reducing the financial, social and technical cost of doing business.

8.3 Supplier Development Agency

The various oil companies have been pressured to put together empowerment deals which result in 25% of their operations being in HDSA hands. Opportunities here are more of the higher level equity stakes and criticised for not delivering local economic development spin offs. The pie is generally just split up differently, but not much value is added in the short to medium term.

The Government recently launched the Supplier Development Agency, a critical component of the Supplier Development Programme, to tackle these issues. The purpose is to establish a government supported (not necessarily funded) entity in collaboration with the industry to identify empowerment opportunities, leverage SPVs to obtain funding and create suitably located and resource incubator sites where people can be trained and SMMEs commercialised.

Consequently, through the SDA, the DME hopes to establish a network of service providers that have been audited to deliver various services with leveraged preference to previously disadvantaged persons and/or entities. The concept of the SDA is not dissimilar to the COGSI concept of leveraging clusters of service providers, except that it takes is mandate from the Liquid Fuels Charter, namely that the petroleum sector committed to a 25% equity stake throughout the value chain for historically disadvantaged South Africans.

Broadly speaking, and based on the 2 April Declaration of Intent, the SDA's mandate is "to accelerate progress in the empowerment of HDSAs in the petroleum industry through increased access to industry procurement opportunities". Specifically, this will be achieved by, for example, HDSA supplier accreditation, consolidating existing HDSA supplier development efforts, matching supplier capacity to industry needs, providing information to HDSA suppliers, as well as reporting successes and compliance.

A phased development approach will be implemented by the SDA. Attention will be given to initiatives that can produce results in the short-, medium- and long-term, thus ensuring that the SDA remains effective without taking on more responsibilities than it can handle. In addition, the Agency's initiatives will be structured in the form of projects to ensure that proper time, cost and quality controls are maintained.

8.4 Business model

In February 2004, the DME and the industry agreed on the basics for the strategy for the Supplier Development Agency.

i) Agreement on the fundamentals of the structure of the SDA with regard to:
ii) Role and function,
    a. Brokering,
    b. Skilling of HDSA companies/persons
    c. Sourcing suppliers of service from banking to training
    d. Development and maintenance of a procurement database
    e. Strategising interventions to overcome the fundamental barriers to entry identified
iii) Mandate,
iv) Agreement on the principles of defining HDSAs
v) Agreement on the categorisation of the contract and subsequent requirements for bidders,

With regard to the database development, a number of principles were agreed for further assessment, namely:

i) Refined definition of HDSA
ii) Equity ownership must also be reflective of employment equity
iii) The design of a scorecard system for categorising HDSA suppliers with specific issues outline as follows:

a. Equity value vs. % ownership
b. Categories of recognition
c. The issue of listed companies and trusts that were difficult to 'empower' or where actual equity was diluted due to cross ownership and pre-emptive rights.

After much deliberation of these principles, the SDA was officially launched in November 2004. The SDA will have suppliers and the industry as its client-base. The suppliers will benefit through being accredited, having access to procurement opportunities and accessing development assistance where necessary, while industry will benefit by having access to accredited suppliers and through the rationalisation of their supplier development efforts as a result of pooling industry resources.

In return, both suppliers and the industry will be levied membership fees, with the provision that the fee levels will be such that they are not an impediment to suppliers' ability to take part in SDA-led initiatives. An important resource will be the SDA database, which will be useful in facilitating interactions between suppliers, service providers (e.g. for finance and training) and the industry.

8.5 Crosscutting issues

8.6 Linkages to COGSI

The SDA will have a mandate to leverage access to procurement contracts and at the same time identifying and leveraging up-skilling opportunities to ensure sufficient capacity to enable HDSAs to take advantage of these procurement opportunities. An important goal of the SDA is to ensure that skills and services are not sterilised by inflexible application only to the reefing sector, consequently generic training to make the HDSA companies sustainable requires leveraging broader access to procurement services such as in the UOG sector.

The types of skills and services are not dissimilar in the petroleum downstream as they are in the UOG sector. And as mentioned in 4.3.9 above, many of the engineering companies (both local and international) are already involved in service supply to the downstream refining sector in South Africa.

Finally, the SDA is a national initiative which provides COGSI with a direst access to the DME and its support for the more general procurement related activities. In many cases operators in the fields are represented in the downstream and leverage exerted in the reefing procurement could be extended to the upstream sector in the name of empowerment and capacity building, with national championship already established.

8.7 Linkages to the Terminalling Hub

The Minister also stated unequivocally that the crude oil purchases should also be included in the strategies to increase the procurement spend to reflect a 25% BEE participation *throughout the petroleum value chain*, as reflected in the industry commitment to the Liquid Fuels Charter signed in 2000.

This raises synergies with any promotion of a terminalling hub where empowerment opportunities could be leveraged in the light of this statement.

8.8 Critical success Factors and Business drivers

Table 8: Critical Success Factors and Business Drivers for the SDA/COGSI synergy

Source[31]	Rest of World – mature industry	Applicable to SA – infant industry	Threat to SDA/COGSI	Opportunities for SDA/COGSI

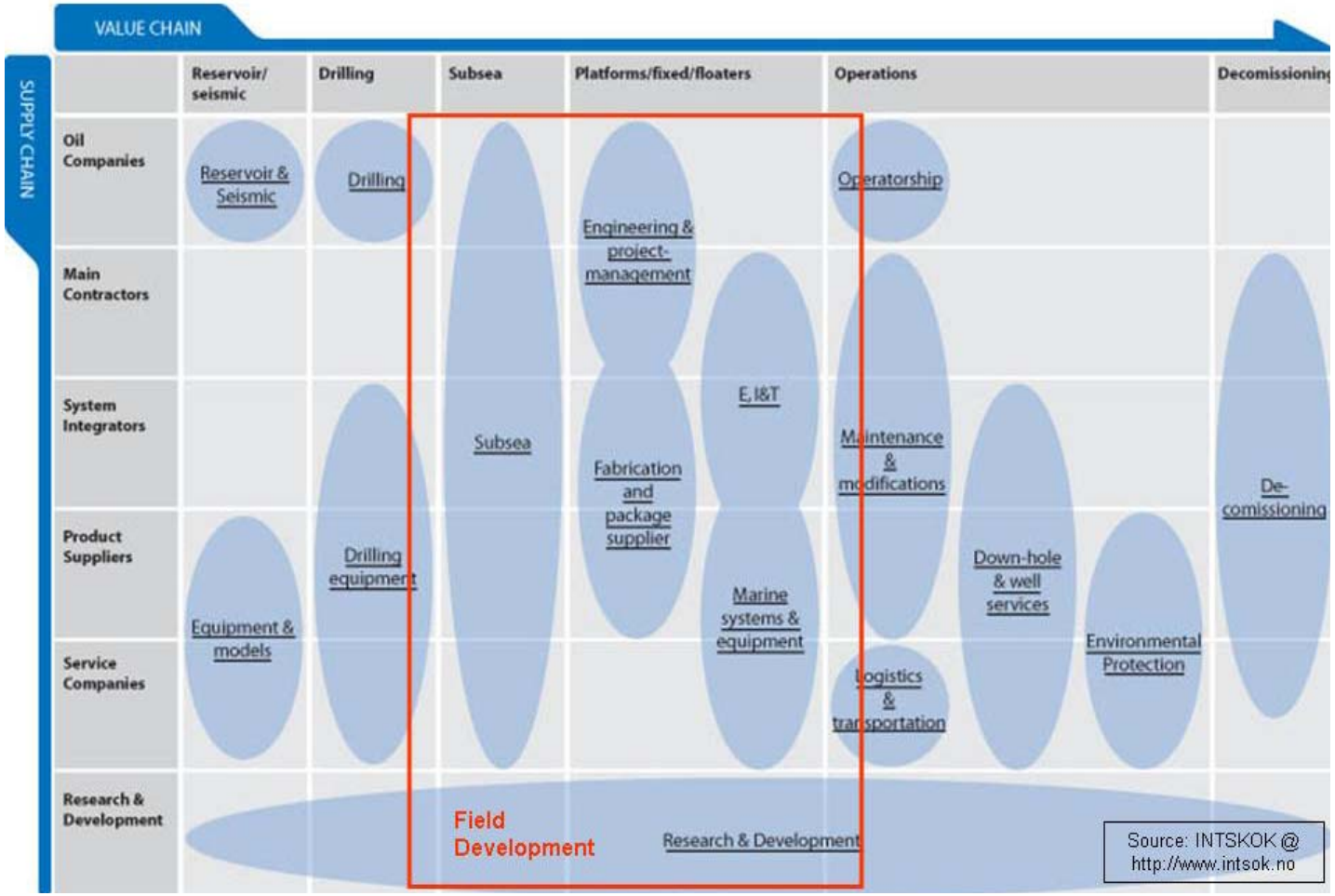
[31] Various sources listed in the bibliography, namely references numbers as follows:

Source[31]	Rest of World – mature industry	Applicable to SA – infant industry	Threat to SDA/COGSI	Opportunities for SDA/COGSI
Critical[32] Success factors	1. Market principles to determine accreditation and subsequent sustainability	1. Leverage is seen as potentially increasing the transaction costs.	UOG Industry players reject the leverage principles in the short term	SDA has national championship and industry buy in which COGSI can use to leverage similar commitments in the UOG sector where appropriate
	2. There must be sufficient skilled capacity to take advantage of the opportunities accessed	2. The SDP has already identified serious skills and capacity gaps in this regard.	Leveraged opportunities increase access of HDSAs, but does not add value to COGSI's cluster and therefore competitiveness suffers – window dressing. Pragmatism must rule as SA is not global player and inappropriate leverage will simply send investors elsewhere	COGSI could start negotiations with stakeholders to access skills levy contributions to place learners in operational/vocational training in anticipation of an increase in demand for labour in the UOG sector. However, the COGSI business plan outlines the need to conduct a skills audit to ensure cost effective spend in this instance.
	3. Start up funding	3. SDA has funding commitments from the industry and the DME	Delays in establishing SDA deter potential suppliers from registering – industry play divide and rule games to undermine unified suppliers strength	COGSI has already identified supplier development but has no funds. COGSI could piggy back on this and already start delivering on skills development.

Critical business drivers	6. Efficient knowledge and information management	6. DME recognised this driver and the SDA has a mandate to fasttrack the development and adaptation of existing databases in this regard	Industry players use 'commercial sensitivity' claims as an excuse to prevent access to data and thus prevent proactive preparation of suppliers to compete.	COGSI could start negotiations with the SDA to share databases and information in this regard. Registration of suppliers is a fundamental prerequisite to accreditation.
	7. Critical mass of investment and employment opportunities from allied initiatives	7. current delays with regard to COGSI and resistance from the downstream sector creates uncertainty regrinding opportunities	UOG developments do not materialise. Terminalling is not viable Refinery viability contracts jeopardising refinery investments and subsequent procurement of services	COGSI and terminalling hub both provide synergies and alternatives for employment and investment opportunities

[32] Presence of either a success factors does not imply success will be attained, and nor does presence of a failure factor imply failure in the long terms as respondents seemed to give each different priorities depending on which list (success or failure) they were assigned to. For example, trust and openness (collaboration) were most important success factors, but absence of the same was ranked third in priority behind clear and consistent goal in first place and a shared common goal in the second instance.

The upstream cluster components in terms of the value chain and the supply chains (which represent the opportunities for COGSI) where the level of integrated activity peaks during the field development phase emphasising the critical need for alignment and coordination to ensure delivery of consistently reliable goods and services in time, in spec and in budget. The COGSI business plan identifies services supply during the exploration and production phases, and sees the potential to access PAU fabrication as the real market share to chase. From the Illustrations in this and the following two appendices, the obvious activity and spend points relate to the development sanctions and the award of the EPIC contracts. The key to sustainable success will be the success at leveraging access into the PAU fabrication and ultimately new build market.

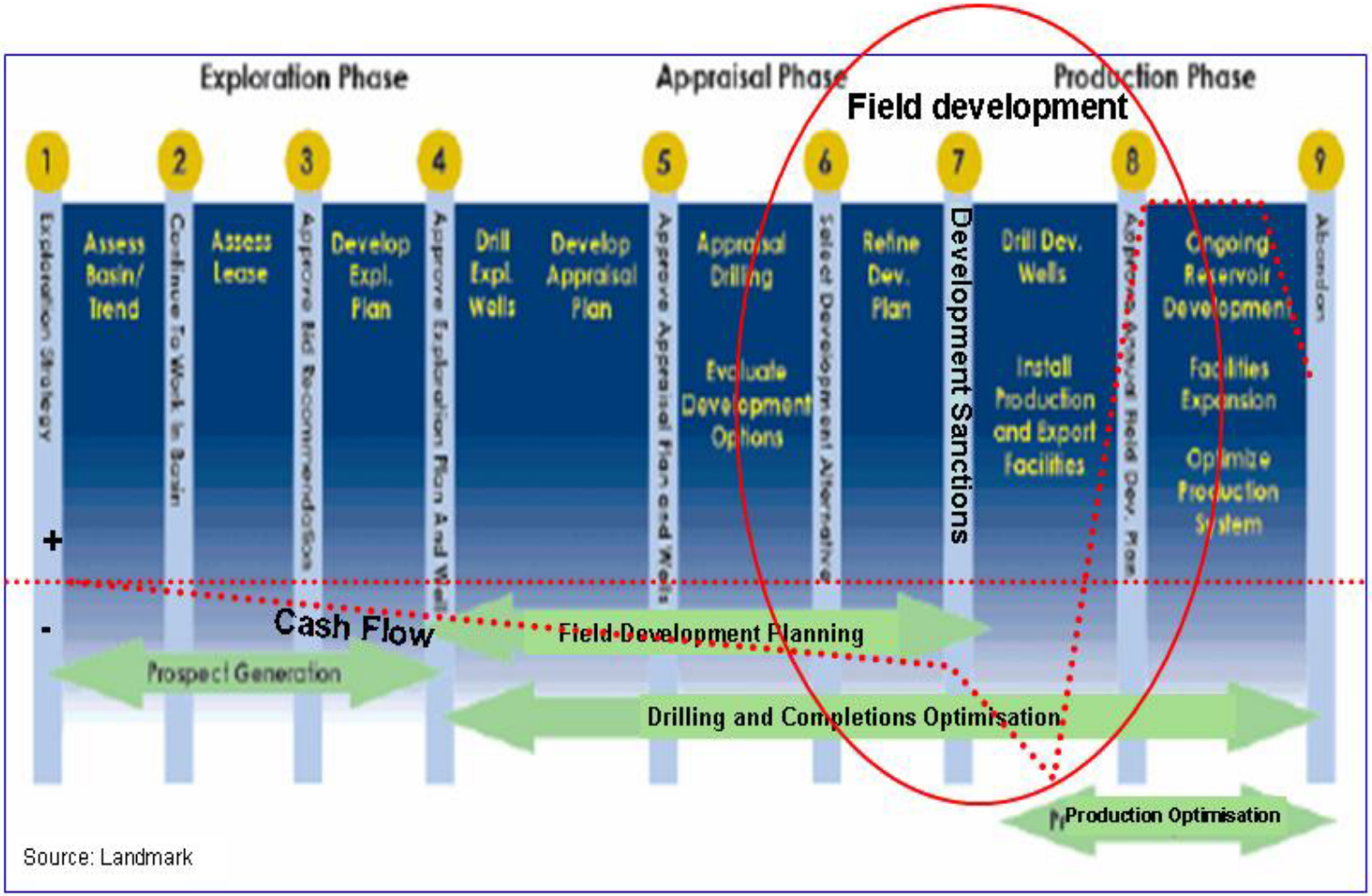


The role of research and development throughout the upstream UOG value chain is evident in this diagram. Cost effective technology and innovation thereof are essential. It is critical that COGSI identify the core aspects of any centre of excellence. Consequently, facilitating the coordination of technology institutes should be a primary role of COGSI.

Wits University developed centre of excellence for the mining industry with proactive support from the Chamber of Mines. The successful leveraging of innovation has kept SA mining at the forefront of technological developments in global mining.

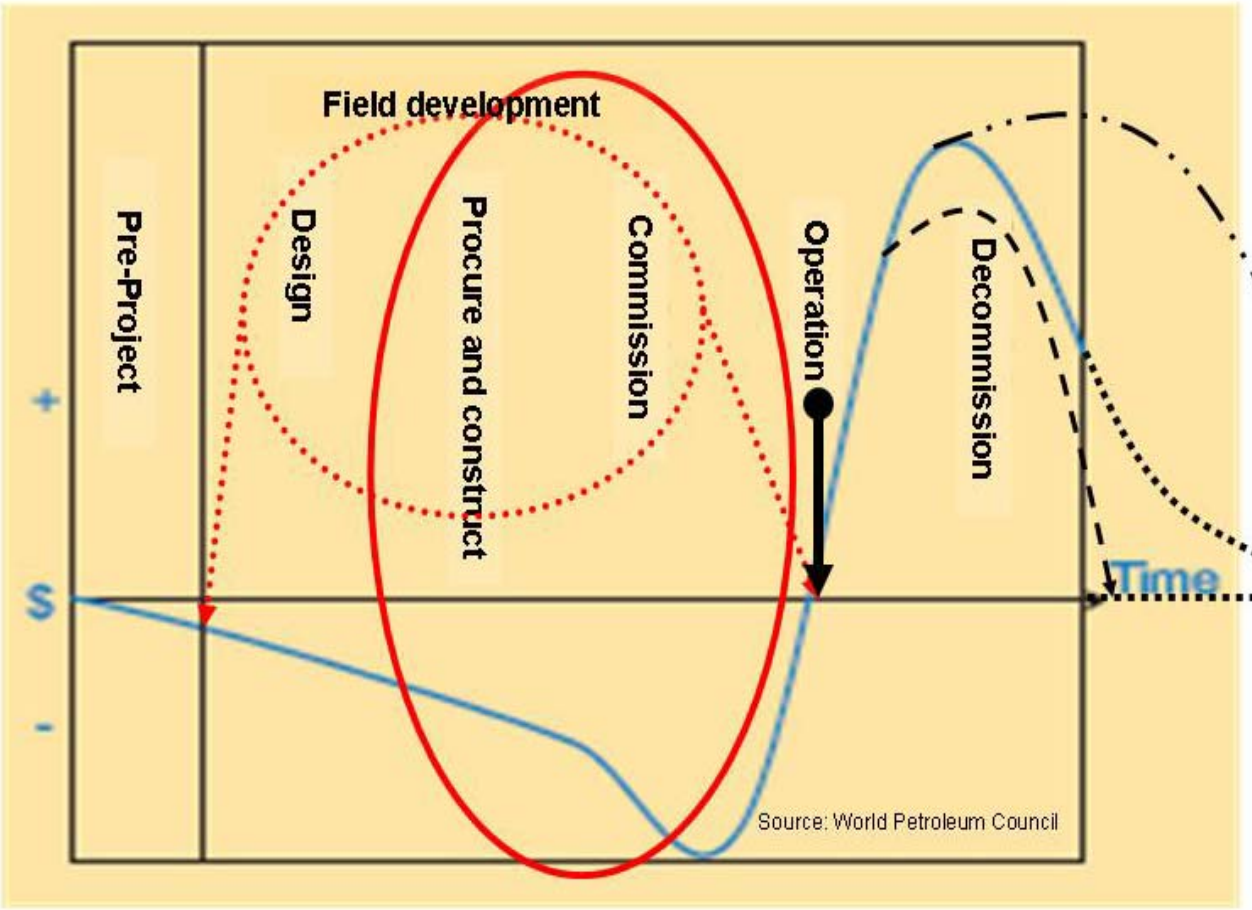
APPENDIX: 6 Upstream field development decision 'nodes'

A multi-company study conducted by Landmark several years ago identified nine key "decision nodes" across the asset life-cycle. Those decision points most critical to field development planning (Nodes 6 to 8 – red ring) typically require the greatest outlay of capital. The level of sophistication and strategic insight of decisions made during field development will have a significant impact on the overall value of the field and associated assets. The field development nodes indicate the decision milestones that trigger different phases of field development. The cash flow is telescoped in Appendix 7 to show more graphically the impact of the negative cash flows during the field development phase. In both cases, one can correlate the activities with the cluster components in the red square in Appendix 5.



"Poor asset management can lead to longer cycle times, decreased quality, increased safety risk, higher operating expense, and less reserves extracted during the asset's total life. This inefficiency can equate to a shortfall of 10-15 per cent of total capital expenditures (CAPEX) with a resulting loss in the hundreds of millions of dollars." (Word Petroleum Congress, 2003)

It should also be remembered at this stage that many countries today put stringent timeframes on operators to move from exploration to production under tight schedules with significant penalties for late implementation. This further pressures operators to rely on contractors that have proven themselves and have a verifiable 'pedigree' in this regard.The further out the 'operation' point gets pushed by delays, the greater the impact of the negative cash flow and the higher crude price required to yield the same return on investment (and royalties for the owner of the resource) within the remaining time period.



From a graphic perspective this is easily illustrated.

Should the field perform in one of three ways, and deliver cash flows according to the three different projection (various dotted line formats), the aim is to achieve and end state where the positive area above the curve from the operation point, is at least as large as that of the negative cash flow under the blue curve. The area under the positive cash flow should ideally be significantly larger than that during the negative cash flow,

As shown in the three hypothetical outcomes, the first curve (long dashes) performs worst and probably does not break even for a possible reason of field failure. The dash, dot, dot line is the best performing with a reasonable excess of positive over negative cash flow.

Various aspects of the development and production can affect the cash flows, such as the height of the production curve (volumes and price of oil), the lifecycle (time on the X-axis) of the project etc. the optimisation of these parameters is the essence of the management of the project and contractors must convince the operators or EPIC contractors that they can deliver consistently reliable goods and services in time, in spec and in budget. Operators are increasingly pushing 'below the line' risks onto contractors.

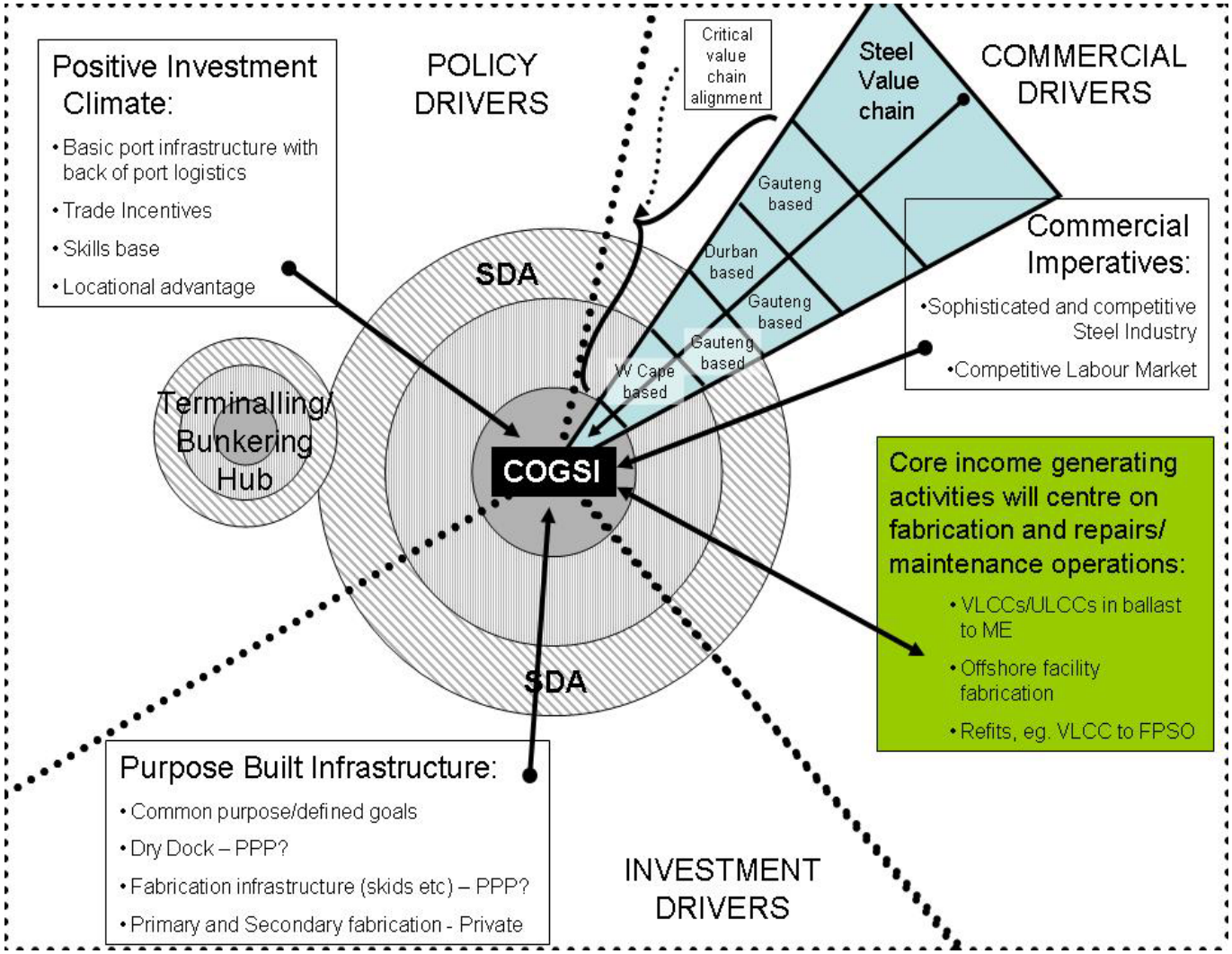


Figure 9: COGSI = f(steel price, steel availability, engineering, innovation, skilled labour, cost of utilities and

The COGSI initiative is a cluster around the beneficiation of steel. Consequently, the alignment of the steel value chain with the cluster will be paramount.

However to attract investors, COGSI will also have to align policy makers to provide a coherent policy direction that is understood, transparent and implementable. The application of trade, industrial and counter trade policy needs to be inclusive in terms of the local/national dynamic.

The key investment driver will be the establishment of purpose built fabrication faculties, preferably at Saldanha's the port can berth large vessels, however the port is exposed and needs additional breakwater protection

Supplier development (SDA) and terminalling both have synergies with COGSI and could provide additional critical mass and support services. Singapore has used its location to leverage comparative competitiveness in terminalling and bunkering

APPENDIX: 9 Comprehensive list of business drivers(sufficient for success) from a high level scan of other UOG clusters

Rest of World – mature industry	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
Collaboration on innovation – joint research and trans-national collaboration	South Africa already has companies that have achieved global recognition in niche areas – capitalise on this by attracting global payers to come and innovation RSA.	Ensure balance between the competitive and collaborative in the cluster principle of collaborative competition as this will promote information and knowledge sharing which will be critical to promote innovation.	There are a number of academic institutions with engineering and other UOG related faculties that could be aligned to promote UOG research and skills development
Pleasant living conditions	South Africa is often cited as being an investment destination due to its fair climate and attractive geography	Safety and security issues for ex patriots – violent crime levels and perception of instability	High profile marketing exercise – the story of the IDA.
Infrastructure that enables operation of the cluster	This cross referenced with critical success factors above	This cross referenced with critical success factors above	This cross referenced with critical success factors above
Establishment of training centres – innovation and skills development	The global skill shortage is exacerbated for RSA when trained and skilled artisan emigrate for various reasons	Insufficient information	Insufficient information
Stakeholders know each other well	Insufficient information	Insufficient information	Insufficient information
Electricity price integral to competitiveness	South Africa is amongst the lowest cost electricity market globally which makes energy intense industries very competitive if all the other cost drivers are correctly aligned	Future capacity investments will result in incremental in crease in electricity prices that will undermine the current comparative advantage	Insufficient information
Local upstream sector an important catalyst for the growth	South Africa does not have this 'absolute' advantage an many UOG services supply hubs have had organic growth closely linked to the presence of a local upstream sector	Other African west coast players are better positioned to exploit the synergies that may exist from having a vibrant UOG sector, such as Nigeria, Angola etc. Local content requirements are leveraging ever increasing amounts of fabrication and integration to ports in Nigeria and Angola.	COGSI or PGWC needs to urgently commission a comparative advantage investigation that will accurately identify those areas where competitiveness can be leveraged by interventions at all levels. A simple example would be if Saldanha had a high rainfall that hindered around the clock fabrication activities and a PublicPrivatePartnership was convinced to invest in very large warehouses where large scale fabrication could be carried

Rest of World – mature industry	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
			out under cover.
Long term career planning	Insufficient information	Insufficient information	Insufficient information
Mobility of labour essential – move with jobs	Insufficient information	Insufficient information	Insufficient information
training incubator concept = train for the future or anticipated developments	Insufficient information	International competition undermines skills demand predictability	Insufficient information
Ensure skills are relatively generic so that those seeking alternative employment can finds it outside of the sector or in associated sectors.	Scarce resources mean that training generally directed to clearly defined sectors where jobs are virtually guaranteed. Neither education authorities nor potential learners will invest funding nor time into careers where opportunities are perceived to be unstable.	E&P technical and operational differences undermines skills demand predictability	COGSI can seek to forge relationships with downstream sectors to promote the access to jobs though multi-skilling in related areas such as refinery and pipeline operations.
'Importing risk' via sub-contractors, onto worksites	Defence off sets are often used to attract marginal projects and the lead company with the offset obligation leads the promotion of the project. However this often means that consortia of various competencies and capacities are pulled together under the banner of the off-set investor. Individual suppliers of service should be ring fenced and subject to transparent and independent due diligence outside of the influence of the lead company if the specific competence being acquired is not the core competence of the off set investor. This especially important where local competence is available and where BEE investors are involved.	Fly-by-night or unaccredited investors are allowed to settle in South Africa. Especially where such players have already come to the attention of local and foreign players as untrustworthy from both a quality and/or reliability proactive. Attraction of anything but the best contractors in this sector will fundamentally undermine the initiative from the start.	COGSI should as a matter of urgency put a code of practise in place that can provide this level of assurance to international operators that dubious operators will be weeded out and not given an opportunity to undermine the initiative and the BEE imperatives of the national and provincial government. COGSI should promote strengthening of relations with traditional bilateral partners of South Africa, such as, though not exclusively, the Norwegians who are willing to invest and commit to skills and technology transfer and who are recognised world leaders in the sector.
Consistently reliable delivery to exacting standards with dedicated post	SA has tarnished its image in this regard, especially with regard to the fabrication	Dwindling skills sets (brain drain) and absence of 'pedigreed' production	South Africa has however shown its global competence in engineering and

Rest of World – mature industry	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
commissioning back up and support	and topside refits and needs to work hard to undermine the negative perception of reliability.	players who will give comfort to operators that outputs will meet exacting global standards and reliability	project management in the UOG sector.
Plant/facility availability – continuous operations with minimum or zero downtime – operational integration of the value chain	Recent accidents and failures at South African petrochemical and refining facilities (especially during **planned** downtime) have focused international attention on safety and standards thus confirming the NPA reports about tardiness to planning and quality in South Africa.	Many of the failures related to 'imported risk' when contractors were on site. Investigations indicate that poor planning and inappropriate skilled workers may have been the cause of these failures.	To identify the essential skills sets and start briefing learners and training institutions in this regard to develop a stream of learners into he sector, appropriate training facilities and career paths for the trained workforce
Rapid achievement of steady state after commissioning, especially developing country environment	The alignment of the public, private and SOE stakeholders has to be implanted as such. Consequently, for operators, they have to juggle priorities related to field development, production, and forward linkages into the economy to reap microeconomic benefits for local communities, such as schools and road infrastructure and of course labour preference where appropriate. In South Africa this has tended to be BEE equity offers that are now more frequently including broad based consortia that can facilitate the flow of wealth back to communities.	Lack of transparency in awarding 'local content' tenders that are perceived as simply increasing the transaction costs and thus avoidable by moving the supply of services to another location/base	COGSI has a unique opportunity to work closely with the provincial and national government in this regard. Both the DTI and DME (Both represented on the OGTT) have played pivotal roles in promoting BEE and now more recently leveraging broader based consortia to get involved, these consortia have included workers organisations, women's groups and community trusts.
Political/country risk has become a major investment driver – realised country risk often results in loss of competitiveness at a overall project level whist at an engineering/operational level the company may be more competitive.	The role out of PublicPrivatePartnerships projects in South Africa has given significant comfort to investors. This enabling role needs to be fostered without undue political influence on commercial decision making in the long run. Certain SA countries in Africa are finding it increasing difficult to compete due to the rising non-operational costs of maintaining workforces in the relevant	NPA rejects proposal to invest in port and other infrastructure. SA companies' operating in SA are good ambassadors for attracting FDI as they provide the country risk mitigation for investors who they team up with. Consequently, any decision that undermines the investment enrolment for SA companies, invariably has a knock on effect of deterring foreign investors	COGSI can go and find a company (or consortium) that would make initial advance to NPA. This would give NPA more comfort that any new infrastructure assets would not be stranded or sterilised due to lack of commitments from serve providers. Other African countries have significant country risk. In Nigeria, companies have huge security costs associated with operating in the country.

Rest of World – mature industry	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
	countries and would see a return to SA as increasing their competitiveness.		
Commitment from 'pedigreed' players who will commit to investing in skills and technology transfer and	Several international 'pedigreed' players do operate in South Africa, such as Fleur, whilst certain local companies such as LTA/Grinaker have achieved pedigree status in West Africa due to successful interactions with the top ten operators such as ExxonMobil and Shell.	National government championship has lacked any serious profile to date – PGWC needs to engage DTI in this regard in order to attract attention of the 'pedigreed' players such as Halliburton and Bechtel and the Norwegian companies such Aker Kværner as who want comfort that the initiative has national backing from a risk perspective.	Use the attendance at trade fairs to promote COGSI. The DME has close links with Norway in the energy sector and PetroSA also has a working relationship with Statoil. PGWC could access this network through close cooperation with the DME – also on the OGTT.
			Leverage, with PGWC, the DTI support for transparent due diligence for investors to ensure maximum use of local companies where expertise exists and to promote partnering in this regard to promoting BEE involvement.
Oil companies take many different approaches to field development based on unique business drivers, their asset portfolio mix and risk tolerance, access to data and experienced manpower, adoption of technology, availability of capital, ownership, management style and so on.	This requires a multi disciplinary approach involving all stakeholders from regulatory authorities, national custodians of data, such a reserve appraisal information, commercial bankers and transaction advisors and alignment of training institutions to mention a few, consequently, PGWC needs to urgently leverage the relevant strategic partners onto the OGTT that will be able to provide strategic direction to government other public sector entities in this regard	This is clearly spelt out in the COGSI business plan. The problem is that COGSI has to achieve relevance in the sector in order for its foresight to be appreciated and taken up for implementation by both the public and private sectors.	COGSI has the opportunity of being able to show it has the insight and initiative to address these issues. The fact that they are generic global issues proves that COGSI is well strategised in terms of its understanding of the critical drivers required to achieve critical mass and facilitate alignment in this regard.
Geographically disperse and complex asset portfolio – management costs	South Africa will rely heavily on imported expertise to develop and plan projects; however, South African expertise on managing such projects and providing engineering services can be promoted.	Insufficient information	South Africa has however shown its global competence in engineering and project management in the UOG sector.
Complex developments – capex (capital	South Africa will rely heavily on imported	South Africa has the lowest	South Africa has however shown its

Rest of World – mature industry	Applicable to SA – infant industry	Threat to COGSI	Opportunity for COGSI
costs)	expertise to develop and plan projects; however, South African expertise on managing such projects and providing engineering services can be promoted.	competitiveness in fabrication especially with regard to poor planning and quality	global competence in engineering and project management in the UOG sector.
Declining pool of skilled resources – labour costs	RSA no different form ROW. UK and RSA experience similar average ages of workforce of 50 – 54 years. This is indicative if the requirement of experience and sectoral knowledge that comes with time	To achieved competency from a skills set, employment opportunities must exist or be leveraged. Young entrants are deterred by the short term insecurity resulting from UOG unpredictable skills demands	SA has an abundant resource of semiskilled labour that is desperate from jobs, extremely motivated to be up-skilled. A mix of generic and specialised skills will enable the market to achieve optimal employability and mobility.
Utilities – electricity, water and related secondary utilities such as steam and gases	SA has a comparative advantage with regard to electricity.	The Western Cape is a high risk area from a water perspective as witnessed during 2004/05 with water restrictions etc. Insufficient or unreliable utility supply could be a threat as water is regarded as a critical cost driver	None obvious
Number of work days (down time) – Industrial Relations, climate etc.	Insufficient information	Western Cape does not have comparable dry days to Dubai, but compared to West African yards it would clearly be comparable.	Insufficient information
Cost of back of port real estate	Also applies, but the port real estate belongs to the NPA and consequently deals could be leveraged though PublicPrivatePartnership and government championship of projects	NPA gets better offers for alternative uses of the land	Insufficient information

APPENDIX: 10 The 'COGSI' Policy Matrix

The table below refers to the distinction between line departments or agencies that champion issues, those that support or facilitate in the roll-out and those that are responsible or mandated to actually implement the issues or action required. For example, DEDT (PGWC) may be the champion of COGSI, however Wesgro/TISA would be useful facilitating agencies, however with regard to obtaining approval for port infrastructure developments, NPA and DPE (Transnet) would be the implementing agencies in this regard. Consequently, **L = Lead**/Championing agency, **F = Facilitating**/Assisting Agency and **I = Implementing** Agency

Required Action	Government Department or Agency														
	PGWC	COGSI	DTI	TISA	IDC	DPE	NPA	DOL	SETAs	DHA	NT	SARS	DST	DME	PetroSA
Infrastructure investment decision	L	F	F	F	F	F	I	-	-	-	-	-	-	F	-
Transparent shared and common goals	F	L/I	F	F	-	-	F	F	-	F	F	-	-	F	F
Institution/relationship building	L	F/I	F	-	-	F	F	-	-	-	-	-	-	F	F
Public - Private relationship building	F	I	F	F	F	-	F	-	-	-	-	-	-	F	F
Spatial integration and clustering	F	L/I	F	F	F	-	F	-	-	-	-	-	-	-	F
Visible national championship	L	F	I	F	-	F	-	F	-	F	F	-	F	F	-
'Nationalisation of COGSI'	L	F	I	F	-	-	-	F	-	F	F	-	-	F	F
Trade and industrial policy	F	F	L	I	F	-	-	-	-	-	-	-	-	-	-
Promote Collaborative behaviour	F	L/I	F	F	F	-	F	F	F	F	-	-	-	F	F
Promote Competitive behaviour	F	L/I	F	F	F	-	F	-	-	-	F	-	-	F	F
Identifiable leadership - appoint a facilitator	F	I	L	F	-	F	F	-	-	-	-	-	-	F	F
Incentivised centres of excellence/innovation	F	L	F	-	-	-	-	-	F	F	F	-	I	-	F
Counter trade credits/local content	F	F	I	L	F	F	F	-	-	-	F	F	-	-	F
Local/national incentives harmony – rates/taxes etc.	F	L	-	F	-	-	-	-	-	-	F	I	-	-	-
Labour and Critical Skills synergy	F	L	-	F	F	-	F	F	I	F	-	F	F	F	F