

Table of Contents

1. Introduction.....	1
1.1 Opportunities for international manufacturers	1
1.2 Objectives and structure of this report	2
2. Regional Analysis	4
2.1 Description of the region	4
2.1.1 Consumption.....	5
2.1.2 Legal and regulatory framework.....	6
2.1.3 Barriers to economic development in sub-Saharan Africa	9
2.2 Upstream activities	11
2.2.1 Overview.....	11
2.2.2 Proven reserves and production	14
2.2.3 Exploration activities.....	21
2.2.4 Recent discoveries of oil and gas.....	24
2.3 Mid- and downstream activity	26
2.3.1 Refineries.....	26
2.3.2 Future oil refineries in sub-Saharan Africa.....	30
2.3.3 LNG plants and terminals.....	32
2.3.4 Chemical plants and other major gas users.....	35
2.3.5 Oil and gas pipelines.....	39
2.4 Oil and gas exports.....	44
2.4.1 Oil exports	44
2.4.2 Gas exports	47
2.5 Oil companies.....	48
2.5.1 African Petroleum Producers Association (APPA), and National oil companies (NOCs).....	48
2.5.2 International oil companies (IOCs)	50

2.6 International suppliers operating in sub-Saharan Africa	53
2.6.1 Major international suppliers	54
2.6.2 Strategies and practices	59
3. Nigeria	63
3.1 Business environment.....	63
3.1.1 Political stability and security	65
3.1.2 Economy	66
3.1.3 Infrastructure	67
3.1.4 Operating in Nigeria.....	68
3.2 Resources and infrastructure	69
3.2.1 Oil.....	69
3.2.2 Gas	73
3.2.3 Oil and gas infrastructure	76
3.2.4 Planned oil and gas projects.....	81
3.3 Laws and regulations.....	85
3.3.1 Petroleum Industry Bill	87
3.3.2 Local content law	88
3.4 Operators and concessionaires	89
3.4.1 International oil companies (IOCs).....	89
3.4.2 Domestic companies.....	96
3.4.3 National oil companies	97
3.5 International and domestic suppliers	99
3.5.1 Overview	99
3.5.2 Upstream	100
3.5.3 Midstream	105
3.5.4 Downstream.....	106
3.6 Future opportunities for international suppliers.....	108

4. Angola	111
4.1 Business environment.....	111
4.1.1 Political stability and security	113
4.1.2 Economy	114
4.1.3 Infrastructure	114
4.1.4 Operating in Angola	115
4.2 Resources and infrastructure.....	117
4.2.1 Oil.....	117
4.2.2 Gas	121
4.2.3 Oil and gas infrastructure.....	123
4.2.4 Planned oil and gas projects.....	125
4.3 Laws and regulations.....	127
4.3.1 Policies and governance of oil and gas in Angola.....	127
4.3.2 Local content law	129
4.4 Operators and concessionaires	130
4.4.1 International oil companies (IOCs).....	130
4.4.2 National oil companies	133
4.5 International suppliers	134
4.5.1 Upstream	134
4.5.2 Midstream	138
4.5.3 Downstream.....	140
4.6 Future opportunities for international suppliers.....	140
5. Equatorial Guinea	142
5.1 Business environment.....	142
5.1.1 Political stability and security	144
5.1.2 Economy	144
5.1.3 Infrastructure	145

5.1.4	Operating in Equatorial Guinea	146
5.2	Resources and infrastructure.....	147
5.2.1	Oil.....	147
5.2.2	Gas	150
5.2.3	Oil and gas infrastructure.....	152
5.2.4	Planned oil and gas projects.....	153
5.3	Laws and regulations	155
5.3.1	The Hydrocarbons Law 2006	155
5.3.2	Local content law	156
5.4	Operators and concessionaires	157
5.4.1	International oil companies (IOCs).....	157
5.4.2	National oil companies	159
5.5	International suppliers	159
5.5.1	Upstream	160
5.5.2	Midstream	161
5.5.3	Downstream.....	162
5.6	Future opportunities for international suppliers.....	162
6.	Ghana	164
6.1	Business environment.....	164
6.1.1	Political stability and security	166
6.1.2	Economy	166
6.1.3	Infrastructure	167
6.1.4	Operating in Ghana.....	168
6.2	Resources and infrastructure.....	169
6.2.1	Oil.....	169
6.2.2	Gas	171
6.2.3	Oil and gas infrastructure.....	171

6.2.4	Planned oil and gas projects	172
6.3	Laws and regulations.....	174
6.3.1	Policies and governance of oil and gas in Ghana	174
6.3.2	Local content law	177
6.4	Operators and concessionaires	178
6.4.1	International oil companies (IOCs)	178
6.4.2	National oil companies	180
6.5	International suppliers	181
6.5.1	Upstream	181
6.5.2	Midstream	182
6.5.3	Downstream.....	183
6.6	Future opportunities for international suppliers.....	184
7.	Mozambique	185
7.1	Business environment.....	185
7.1.1	Political stability and security	187
7.1.2	Economy	188
7.1.3	Infrastructure	188
7.1.4	Operating in Mozambique.....	189
7.2	Resources and infrastructure.....	190
7.2.1	Oil.....	190
7.2.2	Gas	191
7.2.3	Oil and gas infrastructure.....	197
7.2.4	Planned oil and gas projects.....	197
7.3	Laws and regulations.....	201
7.3.1	The Petroleum Law	201
7.3.2	The “Mega-Projects” Law.....	202
7.3.3	Local content law	202

7.4 Operators and concessionaires	204
7.4.1 International oil companies (IOCs)	204
7.4.2 National oil companies	205
7.5 International suppliers	207
7.5.1 Upstream	207
7.5.2 Midstream	208
7.5.3 Downstream	208
7.6 Future opportunities for international suppliers	209
8. Tanzania	211
8.1 Business environment	211
8.1.1 Political stability and security	213
8.1.2 Economy	213
8.1.3 Infrastructure	214
8.1.4 Operating in Tanzania	215
8.2 Resources and infrastructure	216
8.2.1 Oil	216
8.2.2 Gas	217
8.2.3 Oil and gas infrastructure	220
8.2.4 Planned oil and gas projects	221
8.3 Laws and regulations	223
8.3.1 Petroleum (Exploration and Production) Act (1980)	223
8.3.2 National natural gas policy	224
8.3.3 New Model Production Sharing Agreement (2013)	226
8.3.4 Local content law	227
8.4 Operators and concessionaires	228
8.4.1 International oil companies (IOCs)	228
8.4.2 National oil companies	230

8.5 International suppliers	232
8.5.1 Upstream	232
8.5.2 Midstream	233
8.5.3 Downstream.....	233
8.6 Future opportunities for international suppliers.....	234
9. Conclusion and country comparisons.....	236
9.1 International oil companies (IOCs)	236
9.2 International suppliers	238
10. Appendices	241
10.1 Appendix I - Chinese oil companies	241
10.1.1 Investment activity	241
10.1.2 Sinopec and China Sonangol	244
10.1.3 China National Petroleum Corporation (CNPC)	245
10.1.4 China National Oil and Gas Exploration and Development Corporation (CNODC) petrochemical trading company	247
10.1.5 China National Offshore Oil Company (CNOOC)	247
10.2 Appendix II – Featured interviews	247
10.2.1 Interview with a Management Consultant with experience in the Angolan oil and gas industry	247
10.2.2 Interview with an engineering sub-contractor working in Equatorial Guinea	251
10.2.3 Interviews with other oil and gas company employees and contractors working in sub-Saharan Africa	252
10.3 Appendix III – Conclusion matrix methodology	252

List of Figures

2. Regional Analysis	4
Figure 2.1: Regions of sub-Saharan Africa	4
Figure 2.2: Annual GDP growth projection with constant prices (2011-2018).....	5
Figure 2.3: Changes in total oil supply of sub-Saharan Africa (1980-2012)..	11
Figure 2.4: Regional contribution to total global oil supply (1980 and 2012)	12
Figure 2.5: Changes in gross natural gas production in sub-Saharan Africa (1990-2011).....	13
Figure 2.6: Regional contribution to total global natural gas production (1990 and 2011).....	14
Figure 2.7: Top countries of sub-Saharan Africa by proven reserves (2012)	17
Figure 2.8: Top countries of sub-Saharan Africa by production (2012).....	18
Figure 2.9: Refinery operable capacity in sub-Saharan Africa (1992-2012)	26
Figure 2.10: Refinery operable capacity by country in sub-Saharan Africa (2012)	27
Figure 2.11: Major sub-Saharan Africa exporters of crude oil (2010).....	45
Figure 2.12: Sub-Saharan Africa oil exports by destination (2007 and 2012)	46
Figure 2.13: Sub-Saharan dry natural gas exporting countries (2000-2011)	47
Figure 2.14: Distribution of branch office locations for major international manufacturers in Africa.....	60
3. Nigeria	63
Figure 3.1: Nigeria's major oil and gas activity and infrastructure	64
Figure 3.2: Ease of doing business rankings for Nigeria	68
Figure 3.3: Nigeria proven crude oil reserves (1983-2013).....	70
Figure 3.4: Nigeria total oil production (1984-2012)	71

Figure 3.5: Nigerian exports of crude oil (1986-2010)	72
Figure 3.6: Nigerian oil exports by destination (2012)	73
Figure 3.7: Nigerian proven reserves of natural gas (1980-2013).....	74
Figure 3.8: Nigeria gross natural gas production (1991-2011).....	75
Figure 3.9: Nigeria exports of dry natural gas (1991-2011).....	75
Figure 3.10: Drilling activity in Nigeria (2008-2012)	81
Figure 3.11: Proposed Trans-Saharan Gas Pipeline route.....	84
4. Angola	111
Figure 4.1: Angola’s major oil and gas activity and infrastructure.....	112
Figure 4.2: Ease of doing business rankings for Angola.....	116
Figure 4.3: Angolan proven crude oil reserves (1983-2013).....	118
Figure 4.4: Angolan total oil production (1984-2012)	119
Figure 4.5: Angolan exports of crude oil (1986-2010)	120
Figure 4.6: Angolan oil exports by destination (2011).....	121
Figure 4.7: Angolan proven reserves of natural gas (1983-2013).....	122
Figure 4.8: Vented and flared gas, re-injected gas and natural gas production in Angola (1983-2011)	123
5. Equatorial Guinea	142
Figure 5.1: Equatorial Guinea’s major oil and gas activity and infrastructure.....	143
Figure 5.2: Ease of doing business rankings for Equatorial Guinea	146
Figure 5.3: Equatorial Guinea proven oil reserves (1993-2013)	147
Figure 5.4: Equatorial Guinea total oil production (1984-2012).....	148
Figure 5.5: Equatorial Guinea exports of crude oil (1986-2010).....	149
Figure 5.6: Equatorial Guinea crude oil exports by destination (2010).....	149
Figure 5.7: Equatorial Guinea proven natural gas reserves (1987-2013).....	150
Figure 5.8: Equatorial Guinea gross natural gas production (1991-2011)...	151
Figure 5.9: Equatorial Guinea exports of dry natural gas (1991-2011).....	152

6. Ghana	164
Figure 6.1: Ghana’s major oil and gas activity and infrastructure	165
Figure 6.2: Ease of doing business rankings for Ghana	168
Figure 6.3: Ghana crude oil reserves (2005-2013)	169
Figure 6.4: Ghana crude oil production (1991-2012).....	170
Figure 6.5: Ghanaian exports of crude oil (2006-2010).....	171
7. Mozambique	185
Figure 7.1: Mozambique’s major oil and gas activity and infrastructure	186
Figure 7.2: Ease of doing business rankings for Mozambique	189
Figure 7.3: Mozambique proven natural gas reserves (1985-2013).....	191
Figure 7.4: Mozambique gross natural gas production (1991-2011).....	194
Figure 7.5: Mozambique exports of dry natural gas (1991-2011).....	195
Figure 7.6: Mozambique dry natural gas consumption (1983-2011).....	196
8. Tanzania.....	211
Figure 8.1: Tanzania’s major oil and gas activity and infrastructure.....	212
Figure 8.2: Ease of doing business rankings for Tanzania	215
Figure 8.3: Tanzania gross natural gas production (1991-2011)	218
9. Conclusion and country comparisons.....	236
Figure 9.1: Opportunities and risks for IOCs.....	236
Figure 9.2: Opportunities and risks for international suppliers.....	238

List of Tables

2. Regional Analysis	4
Table 2.1: List of hydrocarbon and local content laws.....	6
Table 2.2: Oil and gas production and proven reserves of sub-Saharan African countries	16
Table 2.3: Major FPSOs in sub-Saharan Africa.....	19

Table 2.4: Exploration projects in sub-Saharan Africa.....	21
Table 2.5: Recent discoveries of oil and gas in sub-Saharan Africa	24
Table 2.6: List of refineries in sub-Saharan Africa	28
Table 2.7: New oil refinery projects in sub-Saharan Africa.....	31
Table 2.8: Existing and planned LNG facilities in sub-Saharan Africa	32
Table 2.9: Major chemical plants in sub-Saharan Africa	35
Table 2.10: Major gas-fired power plants in sub-Saharan Africa	37
Table 2.11: Major existing and proposed oil pipelines in sub-Saharan Africa.....	40
Table 2.12: Major existing and proposed gas pipelines in sub-Saharan Africa.....	42
Table 2.13: APPA members and national oil companies for major petroleum-producing countries in sub-Saharan Africa.....	49
Table 2.14: Major international companies involved in sub-Saharan African oil and gas	51
3. Nigeria	63
Table 3.1: Nigeria facts and figures	63
Table 3.2: Gas-fired power stations in Nigeria	80
Table 3.3: Planned oil and gas projects in Nigeria	82
Table 3.4: Major legislation influencing the Nigerian oil and gas sector.....	85
Table 3.5: Major IOCs active in Nigeria.....	90
Table 3.6: Shell's main oil and gas projects in Nigeria	91
Table 3.7: ExxonMobil's main oil and gas projects in Nigeria.....	92
Table 3.8: Chevron's main oil and gas projects in Nigeria	94
Table 3.9: Total's main oil and gas projects in Nigeria	95
Table 3.10: Nigerian domestic oil and gas companies	96
4. Angola.....	111
Table 4.1: Angola facts and figures	111
Table 4.2: Planned oil and gas projects in Angola.....	125

Table 4.3: Pre-salt exploration activities in Angola	126
Table 4.4: Major legislation influencing the Angolan oil and gas sector	127
Table 4.5: Major IOCs active in Angola.....	131
5. Equatorial Guinea	142
Table 5.1: Equatorial Guinea facts and figures	142
Table 5.2: Planned upstream oil and gas projects in Equatorial Guinea	153
Table 5.3: Planned mid- and downstream oil and gas projects in Equatorial Guinea	154
Table 5.4: Major IOCs active in Equatorial Guinea.....	157
6. Ghana	164
Table 6.1: Ghana facts and figures	164
Table 6.2: Oil services providers for the TEN project in Ghana	173
Table 6.3: Major legislation influencing oil and gas in Ghana.....	175
Table 6.4: Key institutions in Ghana's petroleum industry.....	176
Table 6.5: Major IOCs active in Ghana	178
7. Mozambique	185
Table 7.1: Mozambique facts and figures.....	185
Table 7.2: Known and estimated conventional gas resources in Mozambique.....	192
Table 7.3: Recent offshore natural gas discoveries in Mozambique	193
Table 7.4: Industry gas supply requests.....	196
Table 7.5: Planned mid- and downstream oil and gas projects in Mozambique	198
Table 7.6: Relevant local content laws in Mozambique	203
Table 7.7: Major IOCs active in Mozambique	204
Table 7.8: Main state-owned companies involved in the Mozambican oil and gas sector	206
8. Tanzania.....	211
Table 8.1: Tanzania facts and figures.....	211

Table 8.2: Recent offshore natural gas discoveries in Tanzania.....	217
Table 8.3: Planned upstream oil and gas projects in Tanzania.....	221
Table 8.4: Planned midstream oil and gas projects in Tanzania.....	222
Table 8.5: Planned downstream oil and gas projects in Tanzania	222
Table 8.6: Major IOCs active in Tanzania.....	228
Table 8.7: Government institutions involved in the Tanzanian oil and gas sector.....	231
9. Conclusion and country comparisons.....	236
Table 9.1: Opportunities indices for IOCs.....	237
Table 9.2: Risks indices for IOCs.....	237
Table 9.3: Opportunity indices for international suppliers	239
Table 9.4: Risk indices for international suppliers.....	239
10. Appendices	241
Table 10.1: Chinese investments in the sub-Saharan oil and gas sector	242
Table 10.2: IOCs opportunity index.....	253
Table 10.3: IOCs risk index.....	253
Table 10.4: International suppliers opportunity index	254
Table 10.5: International suppliers risk index	254