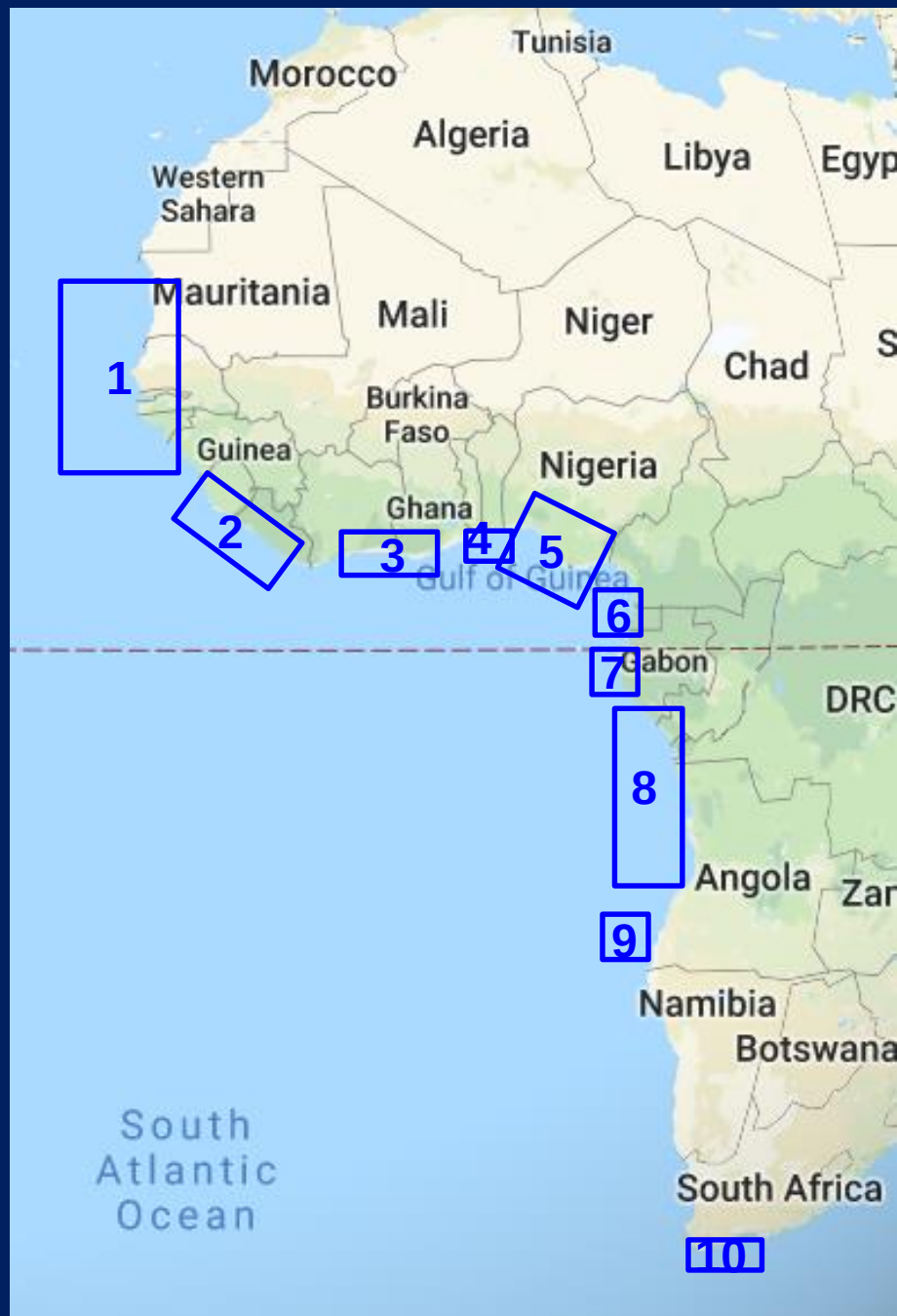


PowerPoint Reports (pdf format) :

1. MSGB
2. Sierra Leone-Liberia
3. Cote d'Ivoire-Tano
(Cote d'Ivoire-Ghana)
4. Benin Embayment
(Benin-Togo)
5. Niger Delta (Nigeria,
Cameroun, Equatorial
Guinea)
6. Rio Muni-Douala
(Equatorial Guinea-
Cameroun)
7. Ogowe Delta (Gabon)
8. Congo Fan (Congo,
DRC, Angola)
9. Kwanza (Angola)
10. Outeniqua (South
Africa)



Price List

(plus applicable taxes)

		£	Report pages	Spreadsheet
1	MSGGB Basin (Mauritania-Senegal-Guinea Bissau)	5,000	99	1
2	Liberia-Sierra Leone Basin	3,000	40	1
3	Cote d'Ivoire - Tano (Ghana) Basin	5,000	82	1
4	Benin Embayment (Benin,Togo, Nigeria)	2,000	42	1
5	Niger Delta Basin (Nigeria, Cameroun, Equatorial Guinea)	5,000	72	1
6	Ogowe Delta (Gabon)	5,000	62	1
7	Rio Muni - Duala Basins (Equatorial Guinea - Cameroon)	5,000	74	1
8	Post-Salt Congo Fan Basin (Angola, Congo, DRC)	5,000	64	1
9	Kwanza-Benguela Basin (Angola)	2,000	43	1
10	Outeniqua Basin (South Africa)	3,000	48	1
	All the reports	30,000	626	10

Each report is prepared in PowerPoint and delivered in pdf format.
 With each basin report it is also delivered a spreadsheet illustrating the main reservoir parameters of fields and discoveries of the basin.

Reports Content

- Exploration Summary
- Creaming Curve of the basin showing major fields and discoveries by Play Type
- Petroleum System Summary, including Stratigraphic column showing major SR's and Reservoirs
- Source Rock Analysis and Summary, including outline of HC Kitchens
- Reservoir Summary, including porosity vs. depth of burial and permeability data
- Traps Summary illustrating major fields and discoveries, including production data
- Play Analysis, including Reservoir Size distribution and Exploration Statistics

See examples in following pages from the Cote d'Ivoire – Tano Basin Report (Ivory Coast – Ghana)

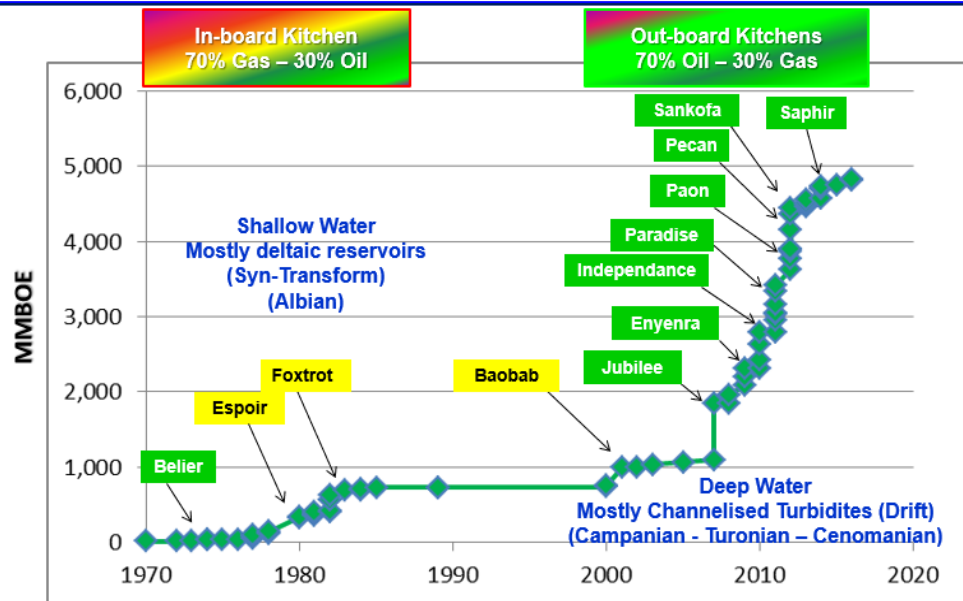
Cote d'Ivoire-Tano Basin Report

sample images

Petroleum Systems of the Cote d'Ivoire – Tano basin
A Quantitative Analysis of Productive Plays



Aug 2018



Espoir

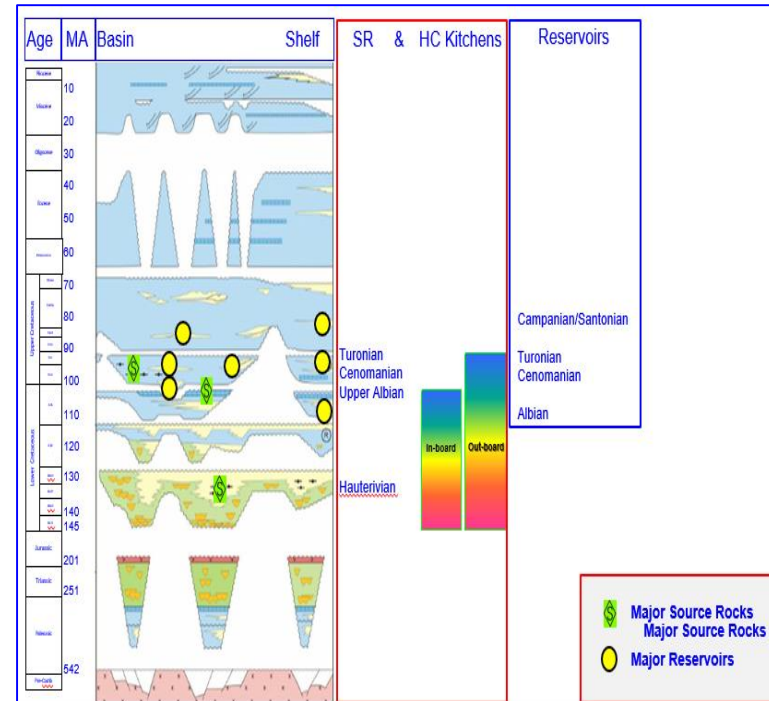
Albian Reservoirs (mostly shallow marine deposition) = ~ 0.9 BBOE 2P Resources

Structural Traps

Belier

Upper Cretaceous Reservoirs (upper to lower slope Turbidites) = ~ 4 BBOE 2P Resources

Stratigraphic Traps

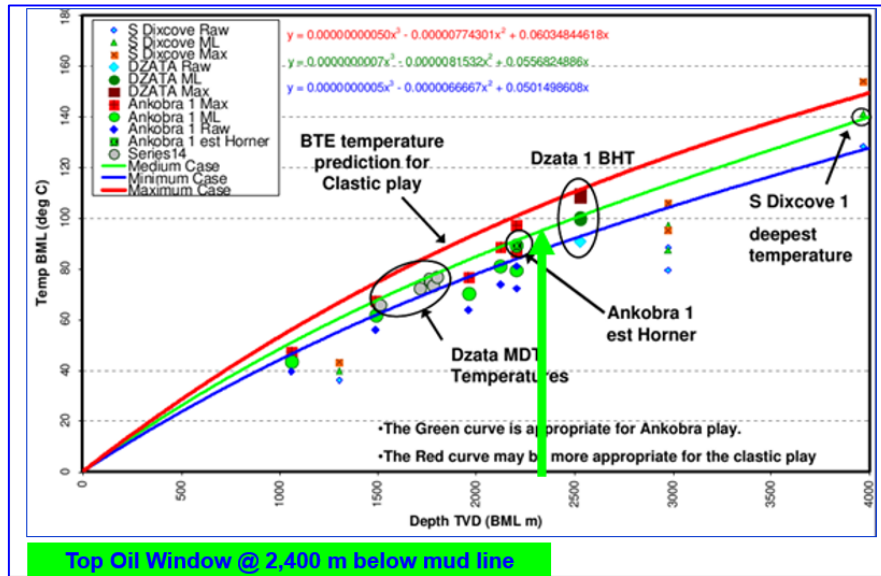


Stratigraphic Column

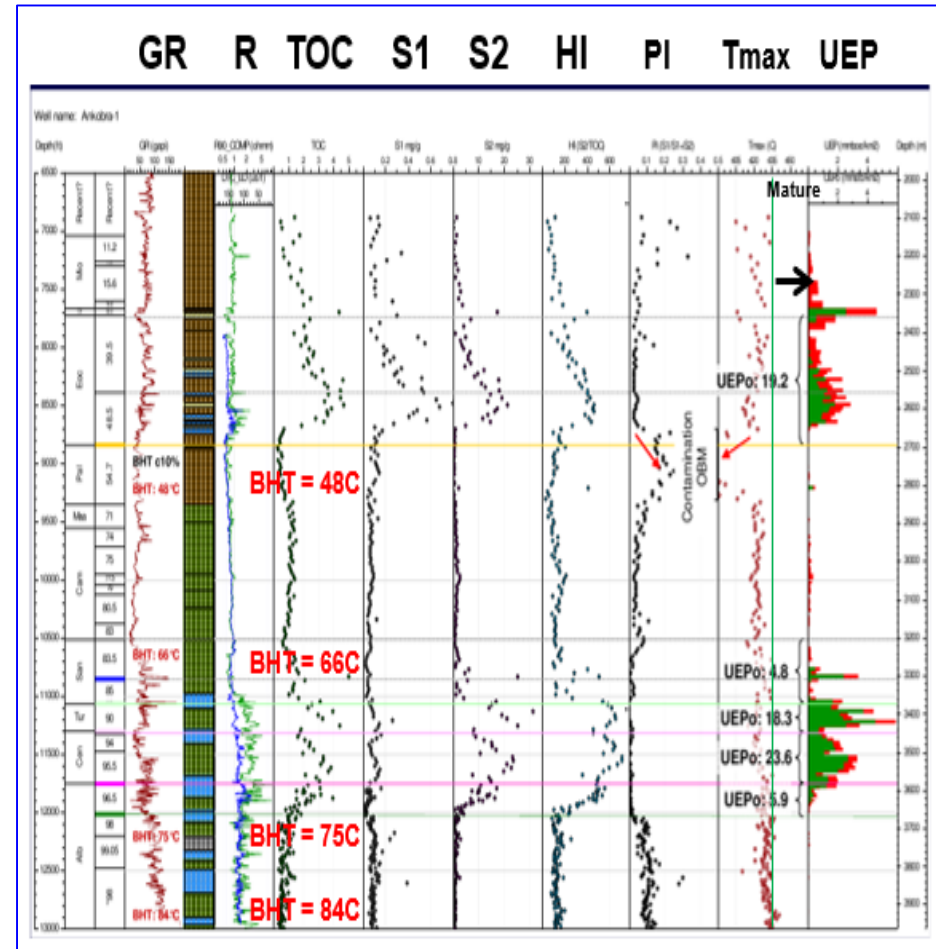
Creaming Curve

Cote d'Ivoire-Tano Basin Report

sample images



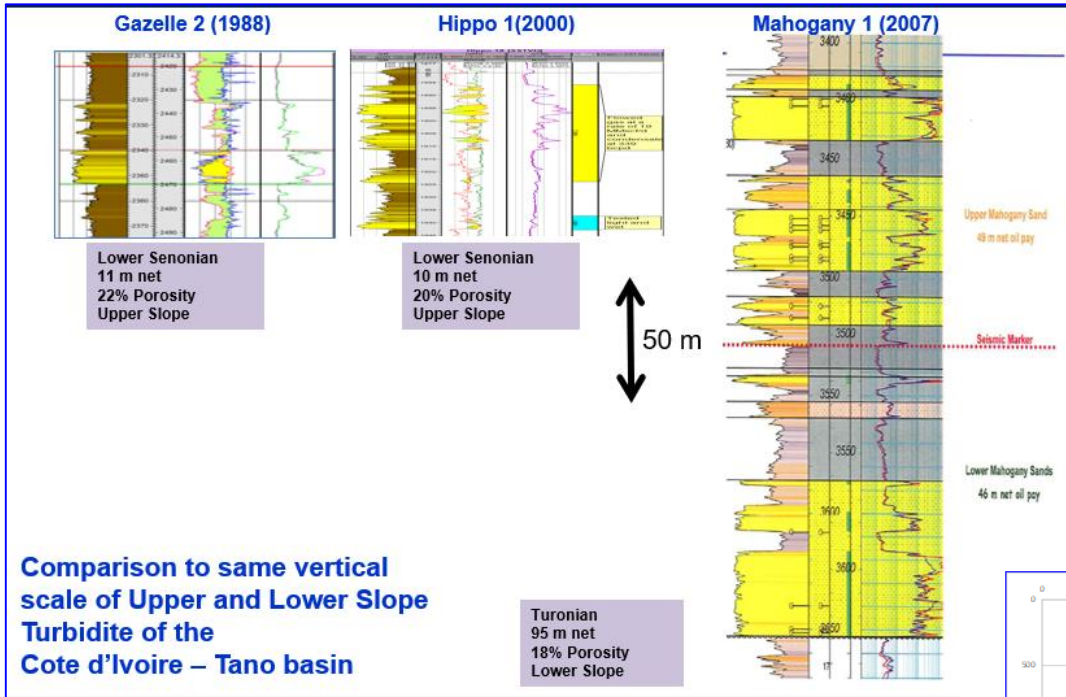
Temperature Plot (C degrees)



SR potential of Basin well

Cote d'Ivoire-Tano Basin Report

sample images



Upper Slope vs. Lower Slope Turbidites

Reservoir Summary

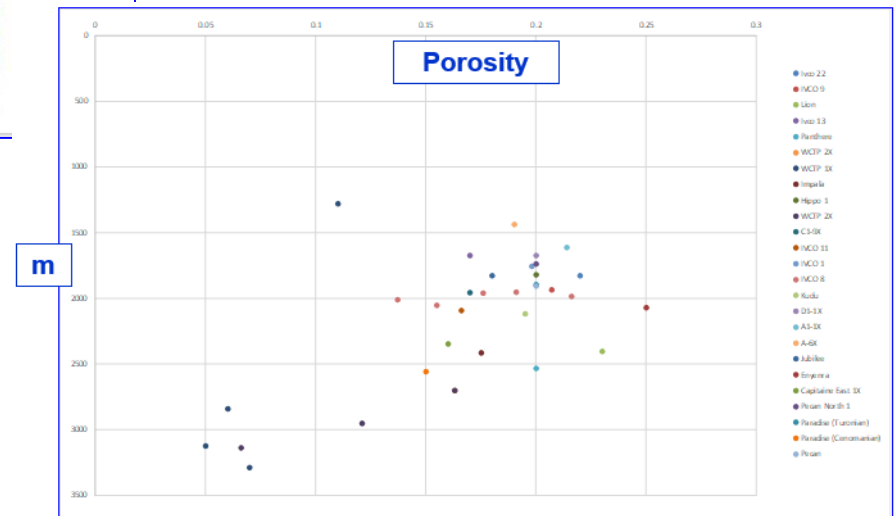
Reservoir quality intervals have been identified both in the Albian Syn-Transfrom section that pre-date the break-up unconformity and in various units of the drift section, including Campanian, Turonian and Cenomanian.

The Albian reservoir units can be up to several hundred meter thick but with very variable N/G (ranging from 40 to 60% in the areas where commercial fields have been discovered, but much lower in part of the shallow water margin (as low as 10% of the section penetrated below the break-up unconformity) that have seen minor clastic input (see West Tano area for instance).

Two major facies have been identified : Lion sands (Upper Albian), which are of better quality and related to shallow to deep marine deposition; Foxtrot sands (Middle Albian), which have lower porosity & permeability, and related to a lacustrine depositional environment. Since the top of the Albian sequence is marked by an erosional unconformity, untested fault blocks carry a reservoir quality risk, even in areas where input of coarse clastic is likely to have occurred.

Porosity (and permeability) depends on facies and depth of burial, with better sands being preserved with less than 2,500 m of overburden, i.e. within the same facies unit, deep-water reservoirs tends to have less overburden and hence being of higher quality (Baobab vs. Espoir, for instance).

The Upper Cretaceous reservoirs were all deposited in an Upper Slope to Lower Slope to Basin Floor environment. Slope deposits are mostly channelised. Upper Slope sediments occurs in present day shallow water and are in general characterised by thin sands (5-20 m) within mud prone canyons. Better N/G occurs in the Lower Slope canyons (with 20-50 m sands) that are located in present day deep water (>1,000 m). Here is were the most important recent discoveries, including Jubilee have been made. As per the Albian there is a relationship with depth of burial and preservation of porosity, such that the reservoirs presently occurring in deep-water tends to have better reservoir properties because occurs underneath less overburden (compare WCTP wells vs. Mahogany 1). Better porosity / permeability seen with 2,000 m or less of overburden.

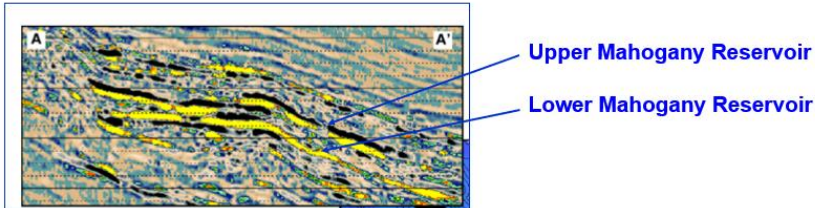


Upper Cretaceous Porosity vs. Overburden

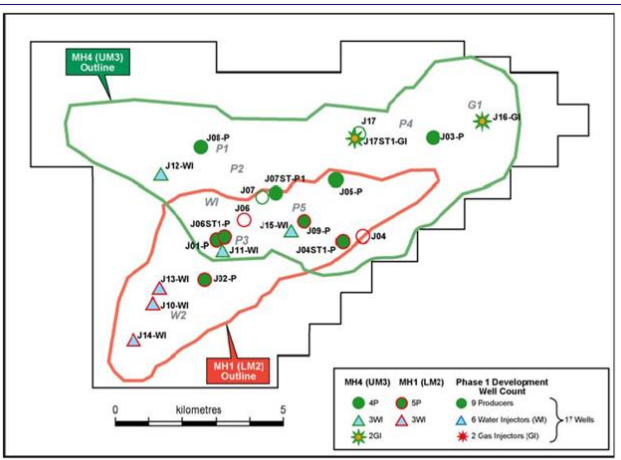
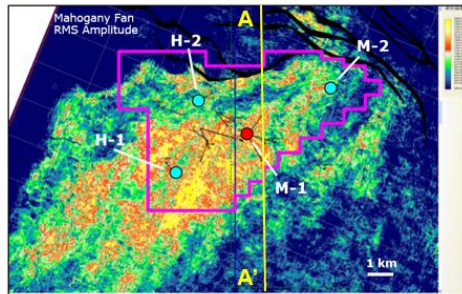
Cote d'Ivoire-Tano Basin Report

sample images

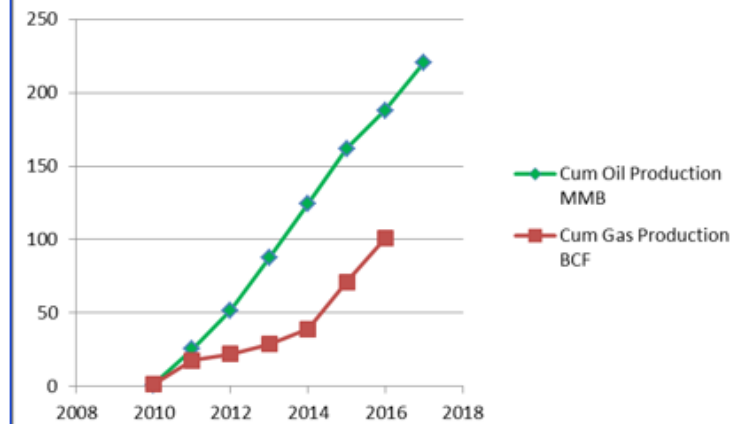
Jubilee, 2007
(624 MMBO + 720 BCFG)



1. Trap : Closure to the North by Fault; Closure to E and W by sand pinch-out
2. Reservoirs : Two Stacked Turonian fans (Upper & Lower Mahogany)
3. Seal Top seal by hemipelagic shales
4. HC column = 350 m (UM) and 400 m (LM)



Phase 1 Jubilee Development Plan as of 2012

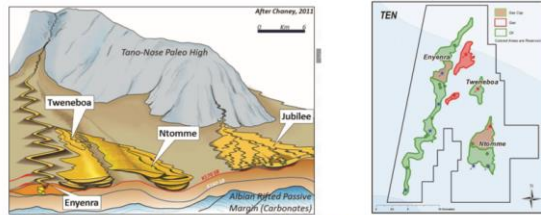


total wells	43	including exploration & appraisals	
producers completed	26		
injectors completed	13		
not completed	1		
Ultimate reserves per producing well	24.00	MMBO	
	27.69	BCFG	
Average reserves per producing well	8.46	MMBO	
	3.85	BCFG	

Cote d'Ivoire-Tano Basin Report

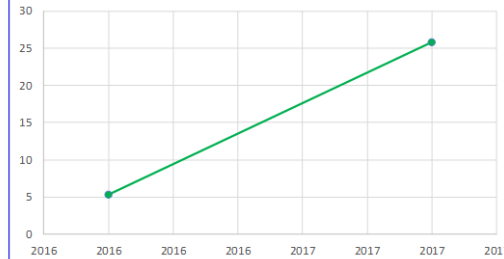
sample images

TEN (Tweneboa, Enyenra, Ntomme) 2009-2010
(324 MMBO + 771 BCFG 2P Recoverable)

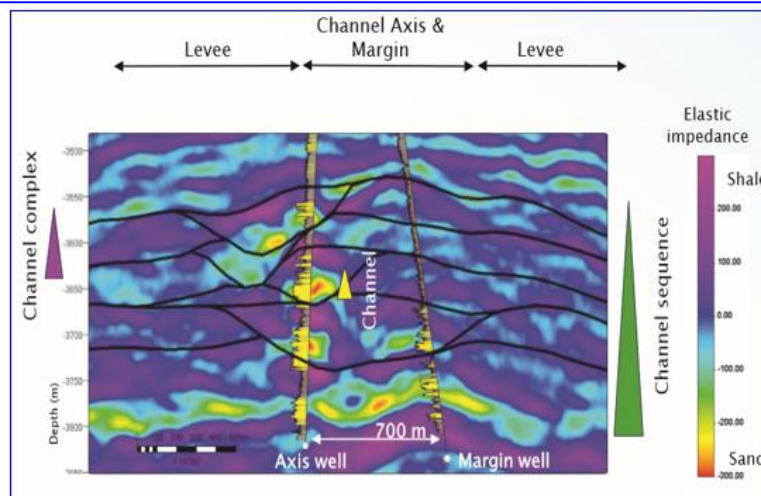
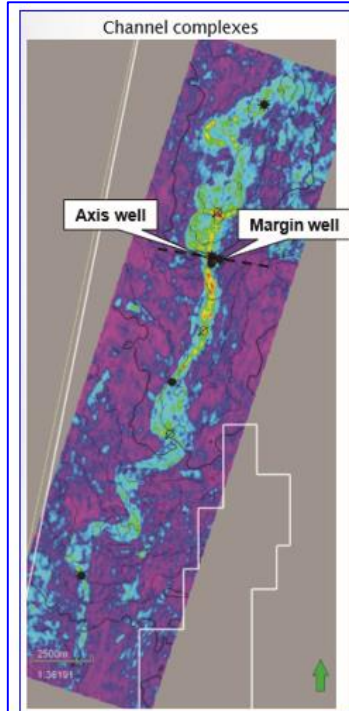


1. Reservoirs : Turonian Lower Slope Turbidite Fans
2. Trap : Closure by pinch-out of reservoirs at the edge of the depositional canyon and updip toward the shelf
3. Seal : Top seal by hemipelagic shales
4. HC column up to 400 m (Enyenra)

Cum Oil Prod MMB



In 2016 both Enyenra and Ntomme have been put on stream.
2017 average production was 56,000 bopd with a total of 16 oil producers, 3 water and 2 gas injectors. Gas from Ntomme is also produced by 2 gas wells.

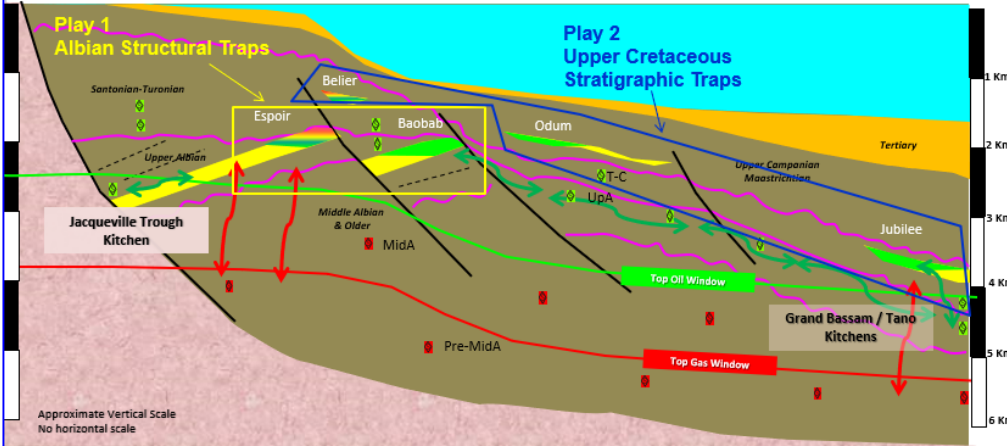


Enyenra, which is the largest oil reservoir of the TEN development, consists of a stacked Turonian channels separated by hemipelagic shales

Cote d'Ivoire-Tano Basin Report

sample images

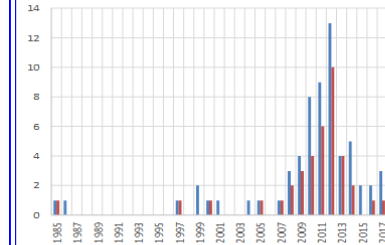
Cote d'Ivoire – Tano basin Established Play Types



Main SR's	oil	gas	Main Fluid Types
T-C	Turonian-Cenomanian		Gas & Oil
UpA	Upper Albian		Oil & Gas
MidA	Middle Albian		
Pre-MidA	Pre Middle Albian		

Play 1: Albian lacustrine to marine sands, including turbidites, in tilted fault blocks, top & lateral seal by Upper Cretaceous shales post break-up unconformity (Examples : Espoir, Foxtrot, Baobab)

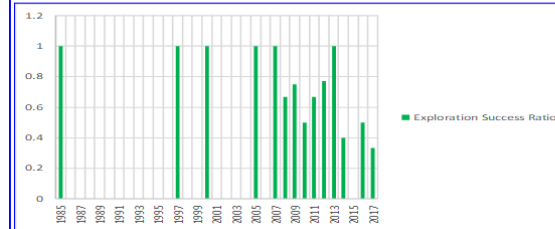
Play 2: Channelised Upper Cretaceous turbidites sands (Campanian, Turonian and Cenomanian) laterally sealed by channel terminations/faults & top and bottom sealed by Upper Cretaceous high-stand shales (Examples : Odum, Jubilee, Enyerna, Paradise, Pecan)



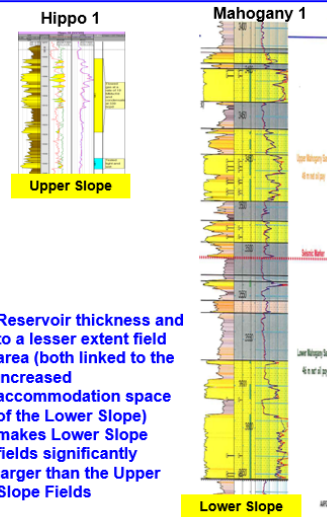
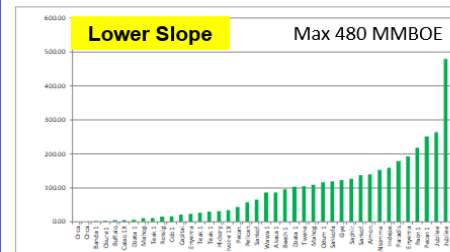
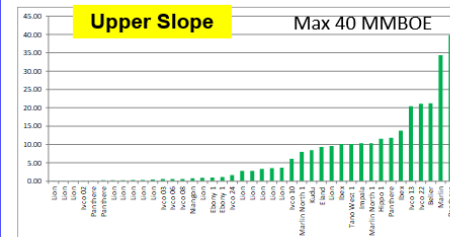
63 Exploration wells drilled to target Upper Cretaceous Turbidites, in shallow water between 1985-2000 and deep-water between 1999 to present. Most of the wells drilled in deep-water.

38 Upper Cretaceous Turbidites discoveries made for a total of ~ 4 BBOE 2P Resources discovered to date

Technical Success Ratio of 60%



Exploration Statistics



Reservoir thickness and to a lesser extent field area (both linked to the increased accommodation space of the Lower Slope) makes Lower Slope fields significantly larger than the Upper Slope Fields

Resource Size Distribution Play 2

Cote d'Ivoire-Tano Basin Report

sample images

Country Names	Basin Name	Field Name	Disc Date Year	Area Km2	Reservoir Name	Age	Lithologies	Top Ground Reservoir Elevation (m)	Water Depth (m)	Overburd en (m)	MMBOE	Oil Recovera ble 2P MMB	Gas Recovera ble 2P MMB	Cond Recovera ble 2P MMB	Oil RF (%)	Gas RF (%)	Cond RF (%)	Ons Offshore	HC Type	Oil API	Porosity (%)	Permeab Avg Md	Current Operators	Prod Operations Status	
Cote d'Ivoire	Cote d'Ivoire-Tano	A-08X	1982		2850 - Upper Albian	Upper Albian	sandstone	2850		269	2581	1.766667		10000	0.1		65		Offshore	Gas,condensate			80		Discovery
Cote d'Ivoire	Cote d'Ivoire-Tano	A1-2X	1984		2000 - Upper Albian	Upper Albian	sandstone	2000		38	1962	0.541667	0.5	250		20		Offshore	Oil,gas	35		80		Discovery	
Cote d'Ivoire	Cote d'Ivoire-Tano	Acajou 1	2003	3.82	1800 - Upper Albian	Upper Albian	sandstone	1800		930	870	26.66667	25	10000		23		Offshore	Oil	33		100	CNR International (Cote d'Ivoire)	Discovery	
Ghana	Cote d'Ivoire-Tano	Akassa 1	2011	7.16	Turonian Series	Turonian	sandstone	3000		1160	1840	87.5	75	75000		30		Offshore	Oil	38				Appraising	
Ghana	Cote d'Ivoire-Tano	Almond 1	2012	47.66	Turonian Series	Turonian	sandstone	4260		2208	2052	140	120	120000		33		Offshore	Oil	31	26		Aker Energy AS	Appraising	
Cote d'Ivoire	Cote d'Ivoire-Tano	Assinie 1	1977	4.91	2505 - Cenomanian	Cenomanian	sandstone	2505		110	2395	18.96667		100000	2.3		75		Offshore	Gas,condensate				Vitol Eastern CDI Ltd	Discovery
Cote d'Ivoire	Cote d'Ivoire-Tano	B-3X	1982		Campanian Series	Campanian	sandstone	2298		387	1911	19.16667		100000	2.5		74		Offshore	Gas,condensate				Eni Cote d'Ivoire Ltd	Discovery
Cote d'Ivoire	Cote d'Ivoire-Tano	Bahia	1981	1.13	2081 - Upper Albian	Upper Albian	sandstone	2081		117	1964	2.216667		10000	0.55		67		Offshore	Gas,condensate				CNR International (Cote d'Ivoire)	Discovery
Ghana	Cote d'Ivoire-Tano	Banda 1	2011	16.11	Cenomanian Series	Cenomanian	sandstone	4000		921	3079	2.333333	2	2000		20		Offshore	Oil	40			Springfield E&P Co Ltd	Discovery	
Cote d'Ivoire	Cote d'Ivoire-Tano	Baobab	2001	11.74	2080 - Upper Albian	Upper Albian	sandstone	2080		1484	596	229.50	217	75000		23		Offshore	Oil	23	20		CNR International (Cote d'Ivoire)	Prod, improved recovery	
Ghana	Cote d'Ivoire-Tano	Beech 1	2012	13.86	Turonian Series	Turonian	sandstone	3600		1750	1850	95.83333	80	95000		30		Offshore	Oil	30	20		Aker Energy AS	Appraising	
Cote d'Ivoire	Cote d'Ivoire-Tano	Belier	1974	9.11	Senonian	Lower Senonian	ale=siltstone	1983		60	1923	21.30667	19.64	10000		30		Offshore	Oil	35				recov	
Cote d'Ivoire	Cote d'Ivoire-Tano	Buffalo 1X	2011		4000 - Turonian	Turonian	sandstone	4000		2400	1600	5.416667	5	2500		10		Offshore	Oil	40			Eni Cote d'Ivoire Ltd	Discovery	
Cote d'Ivoire	Cote d'Ivoire-Tano	Calao 1X	2013		Turonian Series	Turonian	sandstone	4000		1950	2050	5.6		30000	0.6		60		Offshore	Gas,condensate				Quest Energy Ltd	Discovery
Ghana	Cote d'Ivoire-Tano	Cape Three	1974		2768 - Lower	Lower	sandstone	2768		103.02	2664.98	2.166667	0.5	10000		25	71.43	Offshore	Gas,oil	25	23			Discovery	
Cote d'Ivoire	Cote d'Ivoire-Tano	Capitaine East	2014		Turonian Series	Turonian	sandstone	4500		2150	2350	21.66667	20	10000		20		Offshore	Oil	35	16		Eni Cote d'Ivoire Ltd	Discovery	
Ghana	Cote d'Ivoire-Tano	Cob 1	2013	8.13	Turonian Series	Turonian	sandstone	3900		1800	2100	16.33333	15	8000		30		Offshore	Oil	40	19		Aker Energy AS	Discovery	
Ghana	Cote d'Ivoire-Tano	Dzata 1	2010	37.18	Albian Series	Albian	sandstone	3653		1874	1779	103.3333	20	470000	5	25	75	Offshore	Gas,condensate,oil	25				Discovery	
Ghana	Cote d'Ivoire-Tano	Dzata 1	2010		Cenomanian Series	Cenomanian	sandstone	3500		1874	1626	5.833333	5	5000				Offshore	Oil	25				Discovery	
Ghana	Cote d'Ivoire-Tano	Ebony 1	2008	4.72	2053 - Campanian	Campanian	sandstone	2053		87	1966	1.016667	1	100		10	60	Offshore	Oil	35				Appraising	
Ghana	Cote d'Ivoire-Tano	Ebony 1	2008		2570 - Turonian	Turonian	sandstone	2570		87	2483	1.12		6000	0.12			Offshore	Gas,condensate				Vitol Eastern CDI Ltd	Appraising	
Cote d'Ivoire	Cote d'Ivoire-Tano	Eland	1978	12.12	Cenomanian Series	Cenomanian	sandstone	2515		69	2446	9.333333		44000	2		50	Offshore	Gas,condensate					Discovery	
Ghana	Cote d'Ivoire-Tano	Eryenra	2010	40.32	3200 - Turonian	Turonian	sandstone	3200		1882	1318	193.3333	160	200000		31	31	Offshore	Oil	36			Tullow Ghana Ltd	Producing	
Ghana	Cote d'Ivoire-Tano	Eryenra	2010		3500 - Turonian	Turonian	sandstone	3500		1882	1618	23.66667		100000	7			Offshore	Gas,condensate		25			Tullow Ghana Ltd	Appraising
Cote d'Ivoire	Cote d'Ivoire-Tano	Espoir	1980	29.52	West Espoir	Upper Albian	sandstone	1800		360	1440	107.67	95	76000		35	75	Offshore	Oil,gas	33	21		45 CNR International (Cote d'Ivoire)	Producing	
Cote d'Ivoire	Cote d'Ivoire-Tano	Espoir	1980		East Espoir	Upper Albian	sandstone	1980		363	1617	81.67	55	160000				Offshore	Oil,gas	33	21		45 CNR International (Cote d'Ivoire)	Prod, improved recovery	
Cote d'Ivoire	Cote d'Ivoire-Tano	Foxtrot	1982	49.28	Albian Series	Upper Albian	sandstone	2186		100	2086	145.83	5	815000		5		Offshore	Gas,condensate,oil	32	21	18	Foxtrot International LDC	Producing	
Cote d'Ivoire	Cote d'Ivoire-Tano	Gazelle	1977	17.09	LC-4	Lower	sandstone	2200		44	2156	6.71		36000	0.71	27	68	Offshore	Gas,condensate				Vitol Eastern CDI Ltd	Appraising	
Cote d'Ivoire	Cote d'Ivoire-Tano	Gazelle	1977		LC-2 South	Cenomanian	sandstone	2320		44	2276	1.536667		8200	0.17			Offshore	Gas,condensate	31			Vitol Eastern CDI Ltd	Appraising	
Cote d'Ivoire	Cote d'Ivoire-Tano	Gazelle	1977		LC-1	Cenomanian	sandstone	2370		44	2326	5.6		30000	0.6			Offshore	Gas,condensate				Vitol Eastern CDI Ltd	Appraising	
Cote d'Ivoire	Cote d'Ivoire-Tano	Gazelle	1977		LC-2 North	Cenomanian	sandstone	2480		44	2436	0.636667		3400	0.07			Offshore	Gas,condensate	26			Vitol Eastern CDI Ltd	Discovery	

- Spreadsheet, provided in excel format, with main reservoir parameters of Fields and Discoveries colour coded by Play Type (for this basin : Albian shallow marine sands, Upper Cretaceous Upper Slope Turbidites, Upper Cretaceous Lower Slope Turbidites)
- 31 Fields and Discoveries shown in this image out of a total 117 contained in the spreadsheet of Cote d'Ivoire – Tano Basin