2017- MAIN EXPLORATION RESULTS FROM RYSTAD ENERGY
21/12/2017

Very bad year in terms of barrels added
- Less than 7 Gboe
- Main discoveries in Senegal, Guyana and Mexico
- Not accounting for Alaska and Russia? because not tested

- Low investments 40 to 50 Gus$ in conventional exploration

[Graph showing global conventional discoveries from 2012 to 2017]
NEGATIVE WELLS in 2018
Exploration / Appraisal

Major dry Wells 2017-
**NORWAY-LUNDIN** –
Borselv and Hufsa prospects dry – (Loppa High – Permian)

**MAURITANIA**- KOSMOS-
Lamantin (C12) and Hippocampe 1 dry

**GUINEA**- Hyperdynamics- WD : 2897 m!
Fatala 1; oil shows in Cenomanian

**EGYPTE** – BP and TOTAL Block 3 onshore
Deep Oligocene-Miocene

**CYPRUS**- TOTAL and ENI – Block 11-
Very limits trap (10 m gas)

**SURINAME**- TULLOW- Bloc 54
Frontier prospect on Demerara Plateau no res
Lamantin-1- WD : 2200 m/TD : 5150 m
Objectif : Lower Campanian Base of slope with Cenomanian-Turonian SR
Probable lack of trap

Hippocampe 1- TD : 5500 m
Objectives : Lower Cretaceous with Valanginian-Neocomian SR
Probable lack of charge
GUINEA- FATALA PROSPECT: SO NICE, SO DRY!

Estimated recoverable resources:
- 2.6 BBO top 7 prospects
- 4.8 BBO all prospects

NSAI (March 2016)

* Netherland Sewell recoverable resource estimates
SURINAME: ARAKU FRONTIER EXPLORATION ON THE DEMERARA PLATEAU - TULLOW OP,
POSITIVE WELLS 2017 Exploration / Appraisal
Latin America, Senegal and ARTIC

Major positive Wells 2017-

**MEXICO**-ENI – Swallow waters Campeche-
Amoca 2 and 3-Mitzon2-Teocalli2 all positive Light oil (30° API) bearing Pliocene new reservoir I 2 Gbo IOIP

**MEXICO**-TALOS Energy-Block 7- Campeche
Zama 1, Light oil bearing Miocene, 2 Gbo IOIP

**MEXICO**-PEMEX Onshore Veracruz-
Ixachi 1, 350 Mboe reserves

**COLOMBIA**-ANADARKO-Deep ofshore
Purple Angel 1 and Gorgon 1

**GUYANA**– EXXON- Block Stabroek-
Discoveries of Payara-Turbot and Snoeck and positive appraisals on Lisa 3 and 4,

**SENEGAL**-KOSMOS and BP–Cayar Profond block-
Yakaar WD: 2550 m and TD : 4700m
120 m gas column on 3 levels- 15 Tcf reserves

**SENEGAL**-CAIRN-
FAN South1- 30 km from FAN 1: same field?

**SENEGAL**-CAIRN-SNE Block-
Vega-Regulus (VR-1) Step-out of SNE Field: 100 m oil column
And SNE- 5 appraisal and test

**RUSSIA**-Gaspromneft- Sakalin
Neptune 1 well- 1,8 Gboe IHIP
FAN-South 1-
WD : 2175 m - TD : 5343 m
30 km from FAN-1 Discovery
31° API oil bearing L,
Cretaceous turbidited
Same field than FAN-1 ?

Vega-Regulus (VR-1):
TD : 2759 m - WD :
West appraisal of Albian shelf play : SNE Field,
100 m gross oil column (maxi)

SNE-5 appraisal
DST1- 4500 bopd on 60/64 “
Figure 2: Cross section showing the geological setting for the VR-1 well versus the SNE-1 well
3D Evaluation
1500 Mb unrisked P50 POS from 60 % (Sirius prospect) to 15 %
SENEGAL / CAYAR PROFOND KOSMOS (30 %) AND BP (NEW OP,, 60 %)

**YAKAAR 1-**
WD : 2550 m / TD : 4700 m,
Deep sea fan
120 m gas discovery in 3 reservoirs 50 m gas pay
Excellent Phi-K

Reserves : 15 Tcf, (= TORTUE !)
Low condensate content : 20 b/Mscf

**Tortue still important for Senegal ?**
After Terranga 140 Gm3 et Yakkar 400 Gm3

**drilling in progress : Requin Tigre (BP 100% paying)**
(Dry Kosmos press release 05/02/18)
REMINDER: ASPO PRESENTATION OF JUNE 2017, REQUIN TIGRE FS !!! VERY DISAPPOINTING „„

Requin Tigre ! DDC and Flat spot ?

The real Sénégal GIANT ?
Payara 1 and 2
WD : 2135 m/ TD : 5812 m
20 m oil bearing sandstones
Reserves : 500 Mbo 3P,

Snoeck 1-
WD : 1560 m/ TD : 5175m
25 m oil bearing sandstones

Turbot 1-
WD : 1808 m/ TD : 5622 m,
23 m oil bearing sandstones

Ranger 1- (2018)- 60 m oil play in carbonates new play

Liza 3 and 4Appraisal
2 Gbo reserves
FID 1st phase : 120 Kbopd
17 wells : 8P, 3 GI, 6WI,
MEXICO - SWALLOW WATERS- BAY OF CAMPECHE - ENI HAT TRICK!

3 main discoveries in shallow waters:
- Amoca 2 and 3
- Mitzon 2
- Tecoalli 2

New play in Lower Pliocene: light oil (30° API) in a heavy oil (15 to 18° API) province!

More than 100m oil pay in each well, 2 Gbo IOIP!
MEXICO CONVENTIONAL WATERS : BLOCK 7 TACOS ENERGY

Zama 1 well
WD ; 160 m/ TD : 3386 m
Upper Miocene Sandstones
200 m oil pay (no OWC found)
30° API oil
2 Gbo IOIP
GOM : NORTH PLATTE 4 APPRAISAL-COBALT AND TOTAL, 650’ OIL COLUMN IN THE EASTERN FLANK OF NP FIELD
After Kronos miocene sandstones gas discovery, two discoveries in 2017:

Purple Angel
- WD : 1835m/TD : 4795 m
- 70 To 110’ net gas

Gorgon 1
- WD 2316m/TD : 4415m
- 260 TO 360’ feet of gas

- Very little news released?
  A new Rovuma Type?
FIRST EXPLORATION DRILLING IN LAPTEV SEA

Most northern well ever drilled in Russia
Tsentalno-Olginskoaya 1 Well
Drilled from shore
3 oil bearing cores 2305-2363 m
Neptune 1 Well
WD : 60 m - TD : 2700 m
3 oil bearing cores from 2305 to 2363 m
1820Mboe IHIP
From GP press release October 2017,
ALASKA NANUSHUK OIL DISCOVERIES

Willow by CONOCO
300 Mboe recoverable light oil

HORSESHOE 1 and 1A
by Repsol/Armstrong
TD : 1828 m
150’ net oil sands
Contingent recoverable reserves ; 1,2 Gbo
Horseshoe 1AND 1A wells
TD : 1800m
46 m of NOP Nanuhuk Fm t 2017

Nanushuk Pikka Unit
A total of 16 positive wells were drilled during four winter drilling seasons. Good quality 30° gravity oil at rates as high as 4,600 bopd and relatively shallow depths make this find particularly attractive.
ALASKA Stratigraphy

New reservoir targets
1) Conventional: Nanushuk and Torok Cretaceous (Sands quality and seals?)
2) Unconventional: Pebble Shale or GRZ or HRZ shales: bad test in Icewine 2,