

# Panoro Energy

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ANNUAL STATEMENT OF RESERVES  
APRIL 2013

## DISCLAIMER

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The information provided in this report reflects reservoir assessments, which in general must be recognized as subjective processes of estimating hydrocarbon volumes that cannot be measured in an exact way.

It should also be recognized that results of future drilling, testing, production and new technology applications may justify revisions that could be material.

Certain assumptions on the future beyond Panoro's control have been made. These include assumptions made regarding market variations affecting both product prices and investment levels. As a result, actual developments may deviate materially from what is stated in this report.

# ANNUAL STATEMENT OF RESERVES 2012

## INTRODUCTION

Panoro's classification of reserves and resources complies with the guidelines established by the Oslo Stock Exchange and are based on the definitions set by the Petroleum Resources Management System (PRMS-2007), sponsored by the Society of Petroleum Engineers/ World Petroleum Council/ American Association of Petroleum Geologists/ Society of Petroleum Evaluation Engineers (SPE/WPC/ AAPG/SPEE) as issued in March 2007.

Reserves are the volume of hydrocarbons that are expected produced from known accumulations:

- In production
- Under development
- With development committed

Reserves are also classified according to the associated risks and probability that the reserves will be actually produced.

- 1P** Proven reserves represent volumes that will be recovered with 90% probability
- 2P** Proven + Probable represent volumes that will be recovered with 50% probability
- 3P** Proven + Probable+ Possible volumes that will be recovered with 10% probability

Contingent Resources are the volume of hydrocarbons that is expected produced from known accumulations:

- In planning phase
- Where development is likely
- Where development is unlikely with present basic assumptions
- Under evaluation.

Contingent Resources are reported as 1C, 2C and 3C reflecting similar probabilities as reserves.

## PANORO ASSETS PORTFOLIO

As of year-end 2012, Panoro was producing reserves from two assets, being the Manati gas field in Brazil and the MKB asset in Congo.

In addition Panoro has eight assets with contingent resources.

A summary description of each asset with status as of year-end 2012 is included below. Additionally we refer to the Company web-site [www.panoroenergy.com](http://www.panoroenergy.com) for background information on each asset.

Unless otherwise specified, all numbers quoted below are net to Panoro's interest.

## MANATI: GAS FIELD OFFSHORE BRAZIL, OPERATOR PETROBRAS, PANORO 10%

The original development plan for Manati called for seven producing wells, but based on initial production experience and reservoir understanding, the Operator concluded that six wells could potentially suffice to drain the reservoirs. The consortium consequently has decided to postpone the decision to drill the seventh well.

With completion of riser repairs in 2011, gas production remained at high levels throughout 2012.

Total production for the field during the year 2012 was 224,586 MMm<sup>3</sup> gas and 3,781 m<sup>3</sup> of condensate, which is 1.436 MMBOE when stated in equivalent units, compared to 0.958 MMBOE in 2011.

As of year-end 2012 the Manati field had cumulative gas production (100%) of 11.13 Bm<sup>3</sup>.

In Jan 2013 a new Reserve certification report was available from Gaffney Cline & Associates (GCA) with the following results:

1P reserves of 9.8 MMBOE, down from 11.1 last year, but reflecting a small increase in 1P reserves when corrected for produced volumes.

2P Reserves decreased from 13.4 to 11.3 MMBOE, and assumes a 7th well drains the northern extension of the field

Reductions reflect produced volumes during 2012 and GCA's new view of reserves considering field performance.

Compression is now planned to be operational beginning in late 2014.

## MKB: ONSHORE CONGO, OPERATOR SNPC (CONGO NATIONAL OIL COMPANY), PANORO 20%

MKB is the term used to name a 700km<sup>2</sup> license area onshore Congo holding three defined accumulations: Mengo, Kundji and Bindi. The accumulations were discovered and produced over a 10 year period by Elf Aquitaine back in the 1980's, but were abandoned in 1993. According to the Operator the MKB

fields may hold above 2.3 billion bbls (100%) oil in place. Initial re-development efforts have been focused on Kundji where test production from two new Kundji wells drilled in 2009 has been conducted since August 2010.

Plans for a step-wise development program have started with a Kundji pilot project with four firm and two contingent wells drilled and completed in the same accumulation as the two 2009 wells. Upon completion of drilling the 4 firm wells, Gaffney Cline & Associates (GCA) was asked to review the Kundji STOOIP potential. The result was a revised P50 STOOIP assessment from 223 MMBBL to 480 MMBBL, an increase of 115%.

With well completion and stimulation activities continuing during 2012 and limited test production, no new Reserve certification exercise has been commissioned with GCA.

For the year end 2012 reserve statements, 2010 reserve numbers are carried forward but adjusted for reported 2012 produced volumes of 0.037 MMBBL. These were based on GCA's best estimate of the Kundji STOOIP of 233 MMBBL (100%).

Year end 2012 certified reserves associated with the 8 well program in the Kundji pilot project area are 1P reserves of 0.52 MMBBL, 2P reserves of 0.76 MMBBL and 3P reserves of 1.08 MMBBL net to Panoro. Note that associated gas is assumed flared at this stage and is not included in the current reserve estimates.

For the 2P reserves case this reflects an average of 0.5 MMBBL total recovery per well (100%) based on the historic Elf production data. With the test results seen so far, we expect this number to be met.

Best estimate Contingent Resources for the entire MKB license is 64 MMBBL to Panoro's share according to a 2009 study by TRACS. This number reflects a case where all three fields are developed and assumes water injection is used to increase the recovery factor. This then represents an upside target at this stage.

### **BS-3: OFFSHORE BRAZIL, OPERATOR PETROBRAS, PANORO 35-65%**

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The BS-3 area offshore in the southern part of the Santos basin holds three Panoro assets: the Cavalo Marinho, Estrela do Mar and Coral oil fields.

Generally, in all the BS3 fields, hydrocarbons are present in up to four separate, vertically stacked carbonate reservoir zones (B1-B4), where commercial production so far has been associated with the lower three. The top zone (referred to as B1), holds significant hydrocarbon volumes in place but has low permeability and has not been commercial with traditional technology.

#### **CAVALO MARINHO FIELD (CVM) 50% TO PANORO**

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The Cavalo Marinho development plan assumes an FPSO is shared with nearby Caravela field (100% Petrobras), providing necessary

utilities, processing facilities and gas export.

Based on the operator's work, Gaffney Cline & Associates (GCA) has revised their interpretations compared to earlier work and now certify 2C Contingent resources of 11.0 MMBOE net to Panoro. (2011 2P reserves was 14.2 MMBOE).

Panoro's internal work on CvM was done with the Norwegian petroleum engineering consultancy AGR. This work shows higher oil in place and involves a proposed development scenario with more production wells and a greater volume of resources. Based on this work GCA allows 19.3 MMBOE as 3C net to Panoro.

At this stage, resources in the low permeability B1-zone of CvM are regarded as prospective. Eventual reclassification is pending results of a B1 pilot program in Estrela do Mar field.

#### **Estrela do Mar field (EdM) 65% to Panoro**

The EdM development plan assumes a stand-alone development solution with a dedicated FPSO and includes a separate, horizontal well to test the low permeability B1-zone.

Based on work done by the operator, Gaffney Cline & Associates (GCA) certified EdM 2C Contingent Resources of 15.6 MMBOE with 9.9 MMBOE attributed to a successful B1 pilot test.

For the proven B2 reservoirs on Estrela do Mar, GCA's 2C volume estimate is unchanged compared to earlier work (5.7 MMBOE net to Panoro).

#### **Caravela Sul field (CVS) 50% to Panoro**

This small field is located within the Cavalo Marinho ring fence just north of CvM, approximately underneath the location of the proposed FPSO for the Cavalo Marinho-Caravela Integrated project.

Future development may be considered and the Operator has performed work indicating a possible upside potential but an eventual development decision has been postponed.

CVS volumes are presently included as contingent resources only related to the lower B4-zone, with a best estimate - 2C of 0.4 MMBOE.

#### **Coral field (CrL) 35% to Panoro**

The Coral field was developed with three sub-sea producing wells and produced in the period 2003 – late 2008, flaring the associated gas.

A pilot water injection scheme was successfully tested during the last 6 months before abandonment.

Both the operator and Panoro have conducted studies to identify the potential for further Coral oil recovery and a future redevelopment of the field is considered. The partners have decided to retain the license.

Remaining CrL volumes are included as Contingent Resources, with a best estimate - 2C of 4.2 MMBOE net to Panoro.

## **AJE: OFFSHORE NIGERIA, OPERATOR YINKA FOLAWIYO PETROLEUM (YFP), PANORO 12.1913%**

The Aje discovery, close to the border with Benin, is predominantly a gas discovery with significant condensate but also contains a separate oil leg.

Various development concepts have been evaluated, but progress towards a development decision has been slow, mainly because of delays in securing a commercially viable gas sales contract through the West Africa Gas Pipeline. Aje volumes, as reported by Chevron (former technical assistant to the Operator) are included as contingent resources, with a best estimate – 2C of 20.7 MMBOE to Panoro's share.

## **CAMARÃO NORTE: OFFSHORE BRAZIL, OPERATOR PETROBRAS, PANORO 10%**

Camarão/Camarão Norte is a discovery extending into the old BCAM-40 (Manati) block. It straddles the block boundary with the neighboring block to the south (BM-CAL-4, 100% owned and operated by a third party). Camarão Norte was declared commercial in July 2009. Five wells have been drilled on the structure (four in block BM-CAL-4), proving the presence of both oil and gas.

A Unitization process is underway and volumes are included as Contingent Resources, best estimate - 2C - of 0.9 MMBOE. This includes both oil and gas volumes considered inside the BCAM-40 ring fence with a 50-50 resource estimate scenario between the blocks.

## **DUSSAFU: OFFSHORE GABON, OPERATOR HARVEST NATURAL RESOURCES, PANORO 33%**

Dussafu is a large exploration block with several small oil discoveries. By year end 2012 a new well was being drilled to test the Tortue prospect. Both the original well and a subsequent sidetrack demonstrated oil in two separate zones. Evaluation of the new discovery is underway, but no volumes were established by year end 2012.

For the 2011 Ruche discovery, volumes as reported by Harvest Natural Resources (Operator) are included as contingent resources, with a best estimate – 2C of 3.7 MMBOE to Panoro's share, bringing the total Dussafu resource base to 5.6 MMBOE (net), including the other Dussafu discoveries: Moubenga and Walt Whitman. These contingent resources do not include the recent Tortue discovery, for which the operator announced a preliminary range of contingent resources between 5 and 45 MMBBL in April 2013.

Studies to evaluate Dussafu development options are ongoing. The conceptual plan is to aggregate the established accumulations with shared infrastructure and to include the recent Tortue discovery.

## **MANAGEMENT DISCUSSION AND ANALYSIS**

Panoro uses the services of Gaffney, Cline & Associates (GCA) for 3rd party verifications of its reserves.

For the reported reserves in Brazil, GCA has based their assessments on work done by the Operator (Petrobras).

For the MKB project in Congo, in-house work done by Panoro staff and consultants form the basis for the reported reserves certified by GCA.

All evaluations are based on standard industry practice and methodology for production decline analysis and reservoir modeling based on geological and geophysical analysis.

Panoro's policy is to update the Annual Statement of Reserves (ASR) whenever there are significant changes occurring or whenever new information becomes available that materially influences the reported results.

Compared to previously reported numbers the consequences for the year-end 2012 ASR are summarized pr asset as follows:

- **Manati:** A new certification is available from Gaffney Cline based on the Operators work reflecting updated production history.
- **MKB:** Previously reported reserve numbers are maintained reflecting the GCA 2011 certification associated to a defined Kundji pilot program (8 wells) covering part of the Kundji area adjusted for 2012 production.
- **BS3:** Volumes previously classified as Reserves have been re-classified as contingent resources. Revised development plans were filed with the Brazilian Petroleum Agency (ANP) in 2012 for Cavalo Marinho and Estrela do Mar and are still under discussion with ANP.

Development of all fields in this area depends on establishing a common gas export solution. Further work is required before concluding.

Discussions are continuing with the Brazilian National Petroleum Agency (ANP) on the extent of B1 pilot testing in the BS-3 area. The filed development plans include provisions for a B1 pilot project, which would include drilling a dedicated horizontal well to test this zone in Estrela do Mar. The pilot would be conducted where previous long term tests have indicated the best B1 production properties. ANP has requested B1 pilot projects on all fields as a condition to approving development plans, while the concessionaires insist on a step wise program where results of the Estrela do Mar pilot should dictate whether additional pilot programs would be warranted.

In Jan 2013 a new Reserve/Resource certification report was available from Gaffney Cline & Associates (GCA) wherein BS3 volumes have been re-classified to Contingent Resources, reflecting the uncertainties related to status of the filed development plans

and the unresolved gas export situation.

**ASSET ACQUISITIONS/DISPOSALS DURING 2012:**

No deals were concluded in 2012.

**ASSUMPTIONS:**

The commerciality and economic tests for the December 31, 2012 Manati reserves volumes were based on condensate and gas sales prices as shown in the following table. Gas price is fixed in Brazilian Reais according to the sales contract, allowing annual escalation with the domestic market inflation. GCA estimates that the balance between that escalation and the exchange ratio to the US dollar would give a net escalation close to 1% per year. Condensate price was based on GCA's future scenario for Brent crude oil price with a US\$ 2.07/Bbl location discount and a US\$0.07/Bbl quality premium.

Both gas and condensate prices have been grossed up for taxes, which are 21.25% for gas (PIS, PASEP, COFINS and ICMS taxes) and 9.25% for condensate (PIS, COFINS).

Year	Condensate US\$/Bbl	Gas US\$/MMBtu
2013	117.37	7.96
2014	111.28	8.04
2015	106.69	8.12
2016	104.19	8.20
2017	107.67	8.28
2018	109.76	8.36
Thereafter	+2% per year	+1% per year

Converting gas volumes to oil-equivalents is done using a conversion factor of 6.29 bbl/m3.

**2012 – 2P DEVELOPMENT (MMBOE)**

End 2011	34.1
Production	-1.473
Revisions	- 20.5
End 2012	12.1

Reclassification of BS3 volumes from Reserves to Contingent Resources constitutes the major change from the 2011 ASR.

Panoro's total 1P-reserves at end of 2012 amount to 10.3 MMBOE. This reflects adjusting for 2012 production.

Panoro's 2P- reserves after similar adjustment is 12.1 MMBOE.

Panoro's Contingent Resource base includes discoveries of varying degrees of maturity towards development decisions. By end of 2012, Panoro's assets contain a total 2C volume of 122.4 MMBOE.

Oslo, April 5, 2013



**Jan Kielland**  
CEO

# ANNEX RESERVES STATEMENT AS OF 31.12.2012

## ANNUAL STATEMENT OF RESERVES

Developed Assets										
As of Dec. 31, 2012	1P/P90					2P/P50				
Panoro Energy	Liquids MMbbl	Gas Bcm	Total MMBOE	Interest%	Net MMBOE	Liquids MMbbl	Gas Bcm	Total MMBOE	Interest%	Net MMBOE
Manati field	1.61	15.3	97.8	10%	9.8	1.84	17.6	112.5	10 %	11.3
<b>Total</b>	<b>1.61</b>	<b>15.3</b>	<b>97.8</b>	<b>-</b>	<b>9.8</b>	<b>1.8</b>	<b>17.6</b>	<b>112.5</b>	<b>-</b>	<b>11.3</b>

  

Under Development Assets										
As of Dec. 31, 2012	1P/P90					2P/P50				
Panoro Energy	Liquids MMbbl	Gas Bcm	Total MMBOE	Interest%	Net MMBOE	Liquids MMbbl	Gas Bcm	Total MMBOE	Interest%	Net MMBOE
Kundji pilot	2.62		2.62	0.20	0.52	3.82		3.82	0.20	0.76
<b>Total</b>	<b>2.62</b>	<b>0.00</b>	<b>2.62</b>		<b>0.52</b>	<b>3.82</b>	<b>0.00</b>	<b>3.82</b>		<b>0.76</b>

  

Non-Development Assets										
As of Dec. 31, 2012	1P/P90					2P/P50				
Panoro Energy	Liquids MMbbl	Gas Bcm	Total MMBOE	Interest%	Net MMBOE	Liquids MMbbl	Gas Bcm	Total MMBOE	Interest%	Net MMBOE
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>

  

Totals										
<b>Total assets</b>	<b>4.225</b>	<b>15.3</b>	<b>100.5</b>	<b>-</b>	<b>10.3</b>	<b>5.66</b>	<b>17.60</b>	<b>116.36</b>	<b>-</b>	<b>12.10</b>

### Reserves Development during 2012:

2P Reserves Development	(MMBOE)
Balance (previous ASR) as of December 31, 2011	34.1
Production 2012	-1.473
Acquisitions/disposals since previous ASR	0.0
Extensions and discoveries since previous ASR	0.0
New developments since previous ASR	0.0
Revisions of previous estimates	-20.5
Camarão Norte	0.9
<b>Panoro total</b>	<b>12.1</b>

### 2C Contingent Resources summary:

Asset	(MMBOE)
MKB	64.0
Cavalo Marinho	11.0
Estrela do Mar	15.6
Coral	4.2
Caravela Sul	0.4
Aje	20.7
Dussafu	5.6
Camarão Norte	0.9
<b>Panoro total</b>	<b>122.4</b>

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