Company In-Depth

11 April 2007 | 40 pages

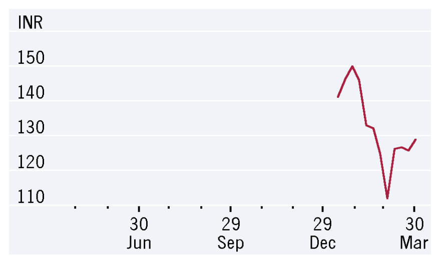
Cairn India (CAIL.BO)

Initiating with Hold; Leveraged to Crude; Exploration Success Key

- **Target price of Rs145 implies moderate upside** — Our valuation incorporating the DCF of core Rajasthan assets (including recovery and exploration upsides) leave only moderate upside. However, with a high leverage to crude and likely near-term resolution of midstream, all things being equal, our risk-reward equation would turn favorable at or below Rs120.
- **Robust resource base topped up by fiscal terms** — Rajasthan block development forms the core, with OIP of 3.6bn boe and reserves (2P+contingent) of 0.8bn boe. Further exploration and appraisal upsides and attractive fiscal terms of the block are value accretive.
- **Midstream solution in sight** — Control over pipeline assets along with cost recoverability of its capex (~US$800m) seems to be a viable solution, with likely resolution by mid-2007. Notwithstanding the nature of crude, this could provide Cairn with the flexibility to narrow the price discount (base case at ~7%) and largely offset its impact on NAV.
- **Potential exploration success sometime away** — With most of the exploratory drilling in 2007 focused in the producing blocks (upside already a part of NAV), new blocks would take a while to deliver results.
- **Risks** — Higher long-term crude expectations and favorable resolution of a cess issue presents potential upside to our target. Delay in production (2H09) and resolution of midstream issues poses downside risks.

Hold/Medium Risk	2M
Price (10 Apr 07)	Rs126.80
Target price	Rs145.00
Expected share price return	14.4%
Expected dividend yield	0.0%
Expected total return	14.4%
Market Cap	Rs223,842M
	US$5,244M

Price Performance (RIC: CAIL.BO, BB: CAIR IN)



See Appendix A-1 for Analyst Certification and important disclosures.

Statistical Abstract

Year to 31 Dec	Net Profit (RsM)	Diluted EPS (Rs)	EPS growth (%)	P/E (x)	P/B (x)	ROE (%)	Yield (%)
2005A	na	na	na	na	na	na	na
2006A	na	na	na	na	na	na	na
2007E	1,458	0.83	na	153.5	0.8	na	0.0
2008E	1,167	0.66	-20.0	191.9	0.8	0.4	0.0
2009E	12,763	7.23	994.0	17.5	0.8	4.4	0.0

Source: Powered by dataCentral

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Fiscal year end 31-Dec	2005	2006	2007E	2008E	2009E
Valuation Ratios					
P/E adjusted (x)	na	na	153.5	191.9	17.5
EV/EBITDA adjusted (x)	na	na	na	40.7	11.3
P/BV (x)	na	na	0.8	0.8	0.8
Dividend yield (%)	na	na	0.0	0.0	0.0
Per Share Data (Rs)					
EPS adjusted	na	na	0.83	0.66	7.23
EPS reported	na	na	0.83	0.66	7.23
BVPS	na	na	165.02	165.03	165.21
DPS	na	na	0.00	0.00	0.00
Profit & Loss (RsM)					
Net sales	na	na	8,039	6,806	22,593
Operating expenses	na	na	-5,616	-4,262	-6,915
EBIT	**na**	**na**	**2,424**	**2,544**	**15,678**
Net interest expense	na	na	-475	-1,008	-1,660
Non-operating/exceptionals	na	na	134	130	129
Pre-tax profit	**na**	**na**	**2,083**	**1,667**	**14,146**
Tax	na	na	-625	-500	-1,383
Extraord./Min.Int./Pref.div.	na	na	0	0	0
Reported net income	**na**	**na**	**1,458**	**1,167**	**12,763**
Adjusted earnings	na	na	1,458	1,167	12,763
Adjusted EBITDA	na	na	6,398	5,296	19,981
Growth Rates (%)					
Sales	na	na	na	-15.3	232.0
EBIT adjusted	na	na	na	5.0	516.2
EBITDA adjusted	na	na	na	-17.2	277.2
EPS adjusted	na	na	na	-20.0	994.0
Cash Flow (RsM)					
Operating cash flow	**na**	**na**	**5,609**	**3,996**	**16,750**
Depreciation/amortization	na	na	3,974	2,752	4,303
Net working capital	na	na	176	77	-316
Investing cash flow	**na**	**na**	**-23,620**	**-16,800**	**-11,110**
Capital expenditure	na	na	-23,620	-16,800	-11,110
Acquisitions/disposals	na	na	0	0	0
Financing cash flow	**na**	**na**	**5,303**	**8,160**	**8,100**
Borrowings	na	na	5,303	8,160	8,100
Dividends paid	na	na	0	0	0
Change in cash	**na**	**na**	**-12,709**	**-4,644**	**13,741**
Balance Sheet (RsM)					
Total assets	**na**	**na**	**305,576**	**313,420**	**322,786**
Cash & cash equivalent	na	na	22,797	19,465	17,262
Accounts receivable	na	na	6,279	5,858	7,133
Net fixed assets	na	na	35,826	47,423	57,718
Total liabilities	**na**	**na**	**14,267**	**22,084**	**31,142**
Accounts payable	na	na	5,627	5,284	6,242
Total Debt	na	na	8,640	16,800	24,900
Shareholders' funds	**na**	**na**	**291,308**	**291,336**	**291,644**
Profitability/Solvency Ratios (%)					
EBITDA margin adjusted	na	na	79.6	77.8	88.4
ROE adjusted	na	na	na	0.4	4.4
ROIC adjusted	na	na	na	0.7	4.9
Net debt to equity	na	na	-4.9	-0.9	2.6
Total debt to capital	na	na	2.9	5.5	7.9

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Valuation

Moderate upside…

Our valuation target of Rs145 is based on NAVs of Cairn's E&P assets (producing as well as under development) as well as a peer comparison on traditional valuation multiples (EV/DACF). We prefer NAV to value the assets of Cairn India as it has long-term visible cash flows arising out of its existing resource base, the value of which cannot be captured using traditional near-term earnings multiples. Traditional valuation multiples will become increasingly important as Rajasthan field approaches first oil, especially if management can demonstrate exploration success and hence build a potential for reserve replacement.

…but high leverage to crude implies good risk-reward at or below Rs120

Cairn's valuation target of Rs145 is leveraged to crude prices and less sensitive to operating parameters vis-à-vis our base case (i.e. commencement of production) and/or reserve upside (which is already factored in our NAV). Meanwhile, we see a reasonable chance of the pipeline issue being resolved if the government allows pipeline capex to be cost recoverable. As a result, the stock will display the highest linkage to long-term crude price assumptions (Citigroup estimate of WTI at US$50/bbl). We believe that the risk-reward equation will turn favorable at or below Rs120, which would adequately factor in all operational risks without building in any upside from potentially higher long-term expectations on crude.

I. Asset-wise NAVs

We calculate Cairn India's NAV by estimating cash flows on an asset-by-asset basis with the associated assumptions for production profile, oil/gas pricing, royalty/cess, opex, and fiscal terms. The tables below summarise our sum-of-parts valuation.

Figure 1. Cairn India – SOTP Valuation

Field	NPV (end-07) US$m	NPV p/s Rs	EV/boe (US$)	CIR Comments
Ravva	103	2.5	10.9	
CB-OS/2	98	2.4	7.6	
Producing Fields	**200**	**5.0**		
Mangala, Bhagyam, Aishwariya (MBA)	4,327	107.1	13.0	Based on cash flow analysis
Rajasthan Pipeline Option	-56	-1.4		Based on incremental pipeline capex/opex
Early Oil	32	0.8	10.0	Discount to implied EV/boe of MBA fields
Rajasthan 'Core'	**4,303**	**106.5**		
Production & Development	**4,504**	**111.5**		
Overheads	-40	-1.0		
Net Cash/(Debt)	240	5.9		Estimated Net Debt as on end-2007 incl. US$600m of IPO proceeds
Financial Items	**200**	**5.0**		
Core NAV	**4,704**	**116.4**		
MBA Recovery Factor Upside	328	8.1	7.5	Incremental 9% EOR recovery. Discount to implied EV/boe of MBA
LPD Reported Resource	348	8.6	7.5	Disclosed 2P resource associated with LPD
LPD Appraisal Upside	87	2.2	7.5	Potential for upside to LPD resource
Exploration Upside	446	11.0	7.5	Potential for basin-wide exploration
Rajasthan Upside	1,210	29.9		
Net Asset Value	**5,913**	**146**		Based on Re/$ rate of Rs43.7

Source: Company Reports and Citigroup Investment Research estimates

We have summarised some key variables for Rajasthan assets and other producing fields below.

Rajasthan Fields

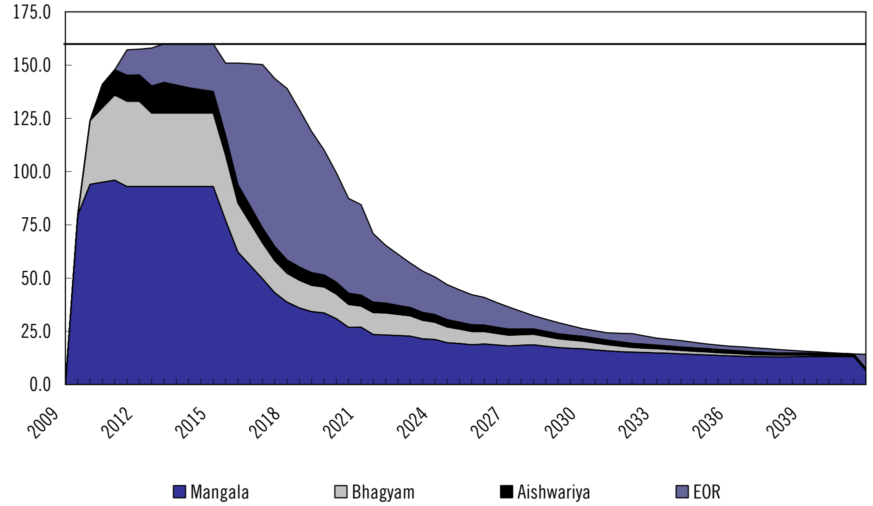
Northern Fields

Our salient assumptions for estimating cash flows of the Northern Rajasthan field are as given below:

1. We assume Mangala field commences production in mid-2009, Bhagyam in January 2010, and Aishwariya in mid-2010.

2. Production profile includes enhanced oil recovery (EOR) – plateauing at 155-160kbpd in 2013 with a plateau production period of 6-7 years. Including EOR, we assume implied gross recovery of 822mmbbl over 2009-41E (proposed period under the FDP).

Figure 2. Cairn India – Northern fields production forecast (mboe/d)



Source: Citigroup Investment Research estimates

3. Total life of field development capex of US$2.3bn with US$680m spent through end-06 (on the approved and pending FDPs).

4. Crude realization is based on a 7% discount to Brent (historical long-term discount of the indicative benchmark Indonesian crudes) and based on Citigroup's medium and long-term oil forecasts (see table below).

Figure 3. Global – Citigroup Investment Research Oil Price Outlook , 2005–10E

US$/bbl	2005A	2006A	1Q 07A	2Q 07E	3Q 07E	4Q 07E	2007E	2008E	2009E	2010E+
WTI	56.5	66.1	58.2	58.0	60.0	60.0	60.0	55.0	50.0	50.0
Brent	54.5	65.4	58.5	56.0	58.0	58.0	58.0	52.5	47.5	47.5

Source: Citigroup Investment Research estimates

5. Cash opex is assumed at US$3.0/boe and at US$8.0/boe for incremental barrels under EOR.

6. Liability of cess is under dispute. Though the PSC does not specifically mention the cess, the issue is likely to linger. We assume a cess of Rs918/MT as Cairn should be able to invoke the fiscal stability provisions of the PSC, thus limiting the applicable rate of cess at Rs918/MT (at the time of the execution of PSC in 1995). Though it is recoverable cost and results in reduction in Profit Petroleum, it reduces cash flows attributable to Cairn, thus having a material impact on NAV. To resolve the cess issue, Cairn is likely to go for international arbitration in end-2007 (when the early oil volumes start), which could offer a ruling by end-2008.

7. Profit Petroleum is calculated after recovering the cumulative F&D investment and opex. As a result, Profit Petroleum becomes available for sharing with the government one year after the commencement of production in Mangala.

8. State take of the Profit Petroleum is calculated based on the investment multiple of the prior year, which is equal to cumulative net cash income (after opex and notional tax) divided by aggregate investment (including exploration). The government's take is estimated as per the schedule below.

Figure 4. India – Government's share of profits

IM achieved (x)	State share of profit oil (%)
0-1	20%
1-1.5	20%
1.5-2	30%
2-2.5	40%
2.5-3	50%
>3	50%

Source: Company Reports

9. Tax holiday of seven years has been assumed on Cairn's share of taxable profits. However, as per applicable Indian tax laws, the MAT payable during this period will be eligible for set off against the applicable tax liability (foreign company tax rate of 42%) beyond the tax holiday period.

Low Permeability Resources (Southern and other smaller fields)

Our NAV for the Northern Fields implies an EV/boe of US$13.0/bbl (end-07) on Cairn's Net Entitlement of Crude (70% share of crude production after cess and state take). We have assumed a lower multiple of US$7.5/boe for the other assets in the Rajasthan field namely:

1. Southern fields of Saraswati and Raageshwari Oil (excluding Raageshwari Gas), which are expected to commence production in 1Q07 (trucking). We believe that the EV/boe multiples of US$7.5/bbl is conservative in the context of much earlier commissioning than Northern fields.

2. Other smaller resources with a total OIP of 1.4bn boe over 12 field discoveries. We have assumed an 8% recovery factor to result in potential 2P Reserves of 115mmboe and applied a similar multiple to Cairn's estimated net entitlement.

Recovery Upside in Mangala

Our assumption for additional recovery upside pertains only to Mangala and is assumed at 9% of STOIIP, taking the potential overall recovery from Mangala to 55%. We have factored in this upside in our valuation assumptions to mainly account for upside from implementation of state-of-the-art EOR techniques.

Potential Exploration Upside

We have assumed an exploration upside of 343mmbbl, 10% upside to basin STOIIP. High prospectivity in the Rajasthan Block and possibility of concrete results in other fields in the block lead us to consider this as part of our estimates for Rajasthan NAV. This also ties in with a reasonably active drilling programme for the block in 2007; in fact, five of the 10 exploration wells planned in 2007 will be in Rajasthan.

We have applied EV/boe of US$7.5/bbl on Cairn’s net entitlement, at a discount to MBA to account for the delayed production from these discoveries. This is also true for any additional recovery upside from the MBA fields. We expect Cairn India to use such upsides in reserves/recovery to extend the plateau, implying that production from new discoveries may start 5-6 years after first oil.

Figure 5. Cairn India – Rajasthan NAV summary

	Range	Gross oil in place mmboe	Recovered (gross) mmboe	Entitlement (net) mmboe	Value US$/bbl	NPV US$m
Mangala		1202	549			
Bhagyam		468	196			
Aishwariya		249	76			
Northern Area Reserves		**1919**	**822**	**333**	**13.0**	**4327**
Saraswati		37				
Raageshwari Oil		42				
Early Oil Production		**79**	**8**	**3**	**10.0**	**32**
Low Permeability Discoveries		1433	115	46		
Resource Upside		**1433**	**115**	**46**	**7.5**	**348**
Mangala Recovery Factor	9% upside	1202	108	44	7.5	328
Resource Upside	25% upside to LPD STOIIP	358	29	12	7.5	87
Exploration Upside	10% upside to Basin STOIIP	343	147	59	7.5	446
Upside		**1903**	**284**	**115**	**7.5**	**862**

Source: Company Reports and Citigroup Investment Research estimates

Rajasthan Midstream – Pipeline Option factored in

Given Cairn's stated preference to own the pipeline and the pending proposal from the company to include pipeline capex as a cost recoverable item, we have explicitly modeled that scenario with the below assumptions. Management expects a resolution of this issue in mid-2007.

- Capex: Pipeline capex of US$800m phased from 2H07 till first oil in 2H09. The initial work and discussion with E&C players for the 531km long Mangala-Viramgam-Salaya pipeline has already begun.

- Opex: Annual pipeline opex of US$15m has been assumed.

- Crude pricing impact: The pipeline is designed to give Cairn access to multiple refineries (including the complex private sector refiners and other coastal refineries), thus potentially helping in the pricing discussions, which are now FOB on benchmark crude. ONGC has been able to sell at 3-4% premium to benchmark FOB though the crude is light/sweet, estimated at 50% of import duty and freight on crude imports. Notwithstanding Cairn's viscous and heavy crude quality, we believe that control over the pipeline can help Cairn narrow its discount to Brent by 1-2% i.e. 7% in base case to 5% in the pipeline option.

Based on these assumptions, we re-run the MBA cash flow model indicating that the pipeline option is marginally NAV negative (-US$56m), which is now factored in our base case NAV explicitly.

Figure 6. Cairn India – Risk-reward favors implementing pipeline

MBA fields NAV sensitivity	Pipeline scenario	Base Model	Impact
NPV end-06 (US$ m)	3528	3583	-56
Discount to Brent for NPV Neutral (%)	5.0%		
Discount for NPV Neutral ($/bbl)	2.4		

Source: Citigroup Investment Research estimates

Producing Fields

The NAV of producing fields of Lakshmi, Gauri, and Ravva Oil were estimated separately based on cash flow analysis. The cumulative recovery in each of these fields over the remaining life is in line with the respective 2P reserves, whereas the gas and oil pricing is based on existing contracts (covered in detail in the later sections). Our key production assumptions are listed below.

- Ravva: Gross production in 2006 was 62kboepd (50kbpd of oil and 71mmscfd of gas), will stay stable in 2007 and decline gradually thereafter to 35kboepd in 2010 and 20kboepd in 2013, the last year of production.

- Lakshmi & Gauri (CB/OS-2): Gross production in 2006 was 21kboepd (3.5kbpd of oil and 99mmscfd of gas) declining gradually to 15kboepd in 2010 and 4kboepd in 2013, the last year of production.

- Other fields in CB/OS-2: For other prospective fields and fields under development in CB/OS-2 viz. Lakshmi Oil, Ambe Gas, and others, we have arrived at a simplified NAV based on overall estimates available for overall 2P reserves + resources for the block. Our assumption for cumulative production from all the CB/OS-2 fields is in line with Cairn's estimates of 2P reserves/resources for the block.

The NAV of Cairn's producing fields is shown in Figure 7 below.

Figure 7. Cairn India – NAV of producing assets

Field	% Share	NPV (end-07) (US$m)	EV/boe (US$)	Comments
Ravva	22.5%	103	10.9	Based on cash flow analysis
CB/OS-2 of which:		98	7.6	
Lakshmi Gas	40.0%	41	9.3	Based on cash flow analysis
Lakshmi Oil	40.0%	26	12.9	Based on cash flow analysis
Gauri	40.0%	24	4.9	Based on cash flow analysis
Other	30.0%	7	11.0	Based on cash flow analysis
Producing Fields		**200**		

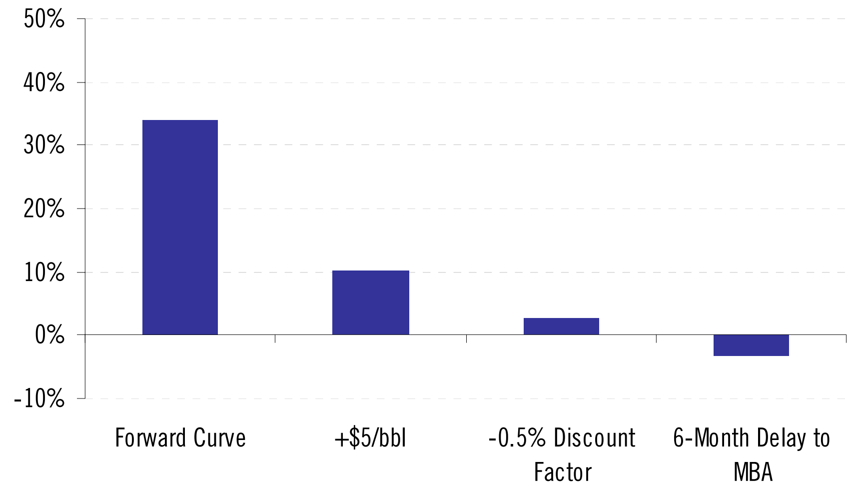
Source: Citigroup Investment Research estimates

The government's take in Ravva is based on a Post Tax Rate of Return (PTRR) and is now at the highest slab of 60%, which will continue for the remaining life of the field.

Sensitivity Analysis

Cairn's NAV is highly leveraged to crude prices as shown in the figure below. Each US$5/bbl change in long-term crude price expectations (base case WTI of US$50/bbl) impacts NAV by 10%. In terms of operations, the sensitivity to any delays is relatively low i.e. 3-4% for a six-month delay to first oil from MBA. The present valuations factor in a conservative view on the operational risks anyway i.e. pipeline capex, first oil in 2H09, cess of Rs918/MT. Cairn could therefore benefit materially if long-term crude price expectations move up (refer to figure below for the sensitivity to the Forward Oil Price curve).

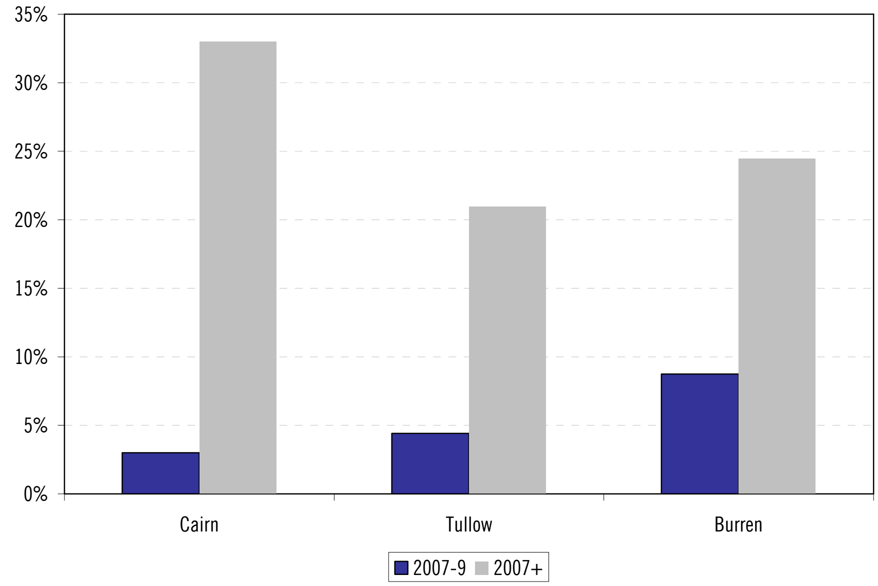
Figure 8. Cairn India – Sensitivity to key parameters



Source: Citigroup Investment Research estimates

In fact, Cairn has among the highest leverage to crude prices amongst Citigroup's rated E&P universe. Because Rajasthan production commences in 2009, the NAV is obviously much more leveraged to the long-term oil prices rather than the medium-term expectations. The figure below highlights the NAV sensitivity in two scenarios: 1) forward curve for 2007-09 followed by Citigroup's crude forecasts; and 2) forward curve beyond 2009.

Figure 9. Cairn India – Comparison of upside sensitivity to crude prices



Source: Citigroup Investment Research estimates

Our base-case assumes an applicable cess of Rs918/MT. The sensitivity to various scenarios is shown below.

Figure 10. Cairn India – Sensitivity of cess

Cess	**Rs/MT**	**0**	**918**	**2,550**
NAV	US$m	6,120	5,913	5,646
Target price	Rs/share	151	146	140

Source: Citigroup Investment Research estimates

Figure 11. Cairn India – Field cash flows, 2007-41E (US$ in millions)

Year to 31 December	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-41
Ravva	42	37	26	22	18	15	12	0												
CB-OS/2	20	29	19	12	8	10	0	0												
MBA	-378	-313	152	1088	1032	882	823	685	661	621	596	539	463	317	206	170	149	132	117	985
Overheads	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-64
Total Field Cash Flows	**-320**	**-252**	**193**	**1119**	**1054**	**903**	**832**	**681**	**657**	**617**	**592**	**535**	**459**	**313**	**202**	**166**	**145**	**128**	**113**	**921**

Source: Citigroup Investment Research estimates

II. Traditional Cash Flow Multiples

We believe that traditional valuation multiples will become increasingly important as the Rajasthan field approaches first oil, especially if management can build a track record of exploration success and hence reserve replacement.

Based on our base case DCF plus upside valuation, the imputed 12-month forward EV/Free cash flow for Cairn India is 6.1x as illustrated in Figure 12 below. We have compounded the end-2007 EV forward by two years (i.e. end-09) by the discount rate, to make it comparable to current multiples of listed companies. This is broadly in line with the EV/DACF[1] of Citigroup's rated universe of global peers (see Figure 13), after adjusting for the fact that long-term crude assumptions are lower than crude prices factored in near-term earnings estimates.

Figure 12. Cairn India – Imputed EV/DACF Range

US$m	Base Case
NAV (end-07E)	5,913
EV (end-07E)	5,673
EV (end-09E)	6,865
DACF (CY2010E)	1,123
Implied fwd EV/DACF	**6.1**

Source: Citigroup Investment Research estimates

[1] DACF (debt adjusted cash flow) = Net income + DD&A + (1 – tax rate)*Interest charge

Figure 13. Cairn India – Global E&P valuation comparables

Company Name	RIC Code	Rating	Mkt cap (US$m)	Price (LC) 3-Apr-07	P/E (x) CY07E	P/E (x) CY08E	EV/EBITDA CY07E	EV/EBITDA CY08E	EV/DACF CY07E	EV/DACF CY08E
Majors										
BP	BP.L	1L	209,133	5.5	5.1	5.1	3.1	3.2	4.4	4.4
RD Shell Class A	RDSa.L	2L	122,287	16.8	5.3	5.7	1.7	1.7	2.3	2.2
RD Shell Class B	RDSb.L	2L	91,437	16.8	5.3	5.6	1.3	1.3	1.8	1.7
Total	TOTF.PA	1L	168,306	52.8	10.0	10.0	4.9	5.0	7.6	7.4
ExxonMobil	XOM.N	1L	437,253	76.8	11.4	12.3	5.1	5.7	8.3	9.3
Chevron	CVX.N	1L	162,567	75.3	9.6	10.2	4.1	4.4	6.3	6.6
ConocoPhillips	COP.N	2M	111,536	67.8	8.0	9.0	4.2	4.5	5.9	6.2
Average					**8.7**	**9.2**	**4.0**	**4.3**	**6.1**	**6.5**
European Integrateds										
BG	BG.L	2M	49,191	7.3	13.7	13.6	6.6	6.8	9.3	9.3
ENI	ENI.MI	2M	129,251	24.2	9.8	10.0	4.2	4.3	6.6	6.5
Repsol	REP.MC	3M	41,513	25.5	10.6	10.9	4.6	4.6	5.8	5.7
OMV	OMVV.VI	1H	18,700	47.0	9.4	9.6	5.0	4.7	5.4	5.1
Norsk Hydro	NHY.OL	1M	42,007	200.0	13.4	13.7	3.8	3.9	8.2	8.0
Statoil	STL.OL	2M	58,088	164.3	10.1	10.3	2.9	3.1	6.4	6.3
Average					**10.9**	**11.1**	**4.4**	**4.5**	**7.0**	**6.9**
US Integrateds										
Hess	HES.N	1H	17,732	56.3	9.3	10.1	3.6	3.7	5.9	6.0
Marathon Oil	MRO.N	2M	34,835	100.7	9.3	10.1	4.1	4.1	6.0	6.0
Occidental	OXY.N	1M	41,628	49.7	10.6	10.0	4.6	4.7	6.9	7.0
Average					**9.9**	**10.1**	**4.2**	**4.3**	**6.4**	**6.5**
Emerging Integrateds										
Lukoil	LKOH.RTS	1L	71,532	84.1	10.2	10.3	7.0	7.1	8.6	8.5
Gazprom	GAZP.RTS	1L	241,943	10.2	9.5	9.3	7.1	6.6	8.8	8.2
Rosneft	ROSN.RTS	2L	89,025	8.4	22.1	23.0	13.1	13.3	15.6	15.7
Petrobras	PBR.N	2H	63,334	99.9	7.9	7.9	3.0	2.9	3.9	3.7
PetroChina	0857.HK	1L	212,098	9.3	11.7	12.7	6.3	6.8	7.7	7.9
Sinopec	0386.HK	1L	14,428	6.7	8.9	10.7	2.0	2.2	2.5	2.7
CNOOC	0883.HK	1L	38,140	6.9	11.9	11.2	6.5	6.4	8.4	8.0
CNPC (HK)	0135.HK	1H	2,403	3.9	6.8	7.3	8.2	8.6	10.0	10.5
ONGC	ONGC.BO	1M	42,048	841.9	8.4	8.7	4.4	4.2	5.4	5.1
PTT E&P	PTTE.BK	1L	9,461	94.0	11.4	10.1	4.6	4.0	5.8	5.2
Woodside	WPL.AX	1M	21,739	39.3	43.7	44.3	10.3	8.1	11.2	8.8
Santos	STO.AX	1M	4,992	10.3	21.0	20.5	4.1	4.5	6.7	7.1
Average					**12.5**	**12.8**	**7.0**	**6.9**	**8.6**	**8.3**
North American E&P										
Anadarko Petro	APC.N	2H	20,447	43.7	12.4	12.5	4.8	5.2	5.7	6.0
Apache	APA.N	2H	23,776	71.8	9.7	10.7	4.3	4.5	4.9	5.3
Canadian Nat'l	CNQ.TO	2H	30,325	65.2	17.5	23.9	7.5	8.5	8.0	8.9
Chesapeake	CHK.N	1H	14,754	32.1	9.9	8.5	4.8	4.3	5.0	4.4
EOG	EOG.N	1H	17,829	73.1	13.4	16.1	6.0	6.4	5.6	6.1
Forest	FST.N	1H	2,108	33.5	11.9	21.7	4.0	5.2	3.9	5.0
Nexen	NXY.TO	2H	15,941	70.3	13.6	15.6	6.0	5.8	6.0	5.6
Noble	NBL.N	2H	10,358	60.7	12.5	13.7	5.8	5.9	6.1	6.4
Talisman	TLM.TO	2H	18,774	20.8	14.5	17.6	4.7	4.9	5.3	4.4
XTO	XTO.N	1H	20,422	55.5	11.8	12.9	6.0	5.8	6.2	6.0
Average					**13.2**	**15.5**	**5.6**	**5.9**	**6.0**	**6.1**

Source: Powered by dataCentral. Note: Averages are market cap weighted.

Building on a Legacy

Cairn has interests in four main PSC areas in India that are either producing or anticipated to come on production within the next 3-4 years, viz. CB/OS-2, RJ-ON-90/1, Ravva, and KG-DWN-98/2. Figure 14 below lists the gross resource base and 2P reserves of Cairn's India assets.

Figure 14. Cairn India – Gross 2P reserves to 2041 and resource summary

mmboe	Gross OIP	2P Reserves	Contingent Resources	2P + Contingent
Rajasthan (RJ-ON-90/1)				
Mangala	1,202	428	120*	549
Bhagyam	468	140	56*	196
Aishwariya	249	56	20*	76
Total 'MBA'	**1,919**	**624**	**196**	**822**
Small fields (Saraswati and Raageshwari Oil)	298	8	7	15
Other fields	1,443	0	54	54
Total Rajasthan	**3,660**	**632**	**257**	**889**
Ravva	506	106	0	106
CB/OS-2 (Lakshmi, Gauri, Ambe, CB-X)	126	16	14	30
KG-DWN-98/2	302	0	143	143
Total	**4,594**	**754**	**414**	**1,170**

Source: Company Reports. * Assuming EOR success.

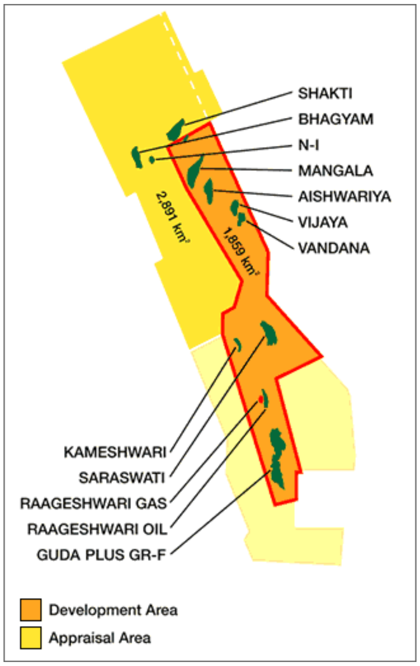
'MBA' fields account for c.70% of total 2P+contingent reserves

Evident in the table above, the RJ-ON-90/1 block is the most noteworthy, with three significant fields accounting for most of Cairn's oil and gas reserves. The three Northern fields of Mangala, Bhagyam, and Aishwariya, which were discovered in the past three years, are at relatively shallow depths in the onshore Rajasthan block, and account for c.70% of Cairn India's total 2P reserves. The Rajasthan onshore block, which is now under development, and the producing assets (Ravva, Lakshmi, and Gauri) are discussed in more detail in the following sections.

I. Assets Under Development

RJ-ON-90/1 (onshore Rajasthan)

Figure 15. Illustrative Map of RJ-ON-90/1



Source: Company Reports

The Rajasthan block, RJ-ON-90/1, comprises 4,743sq.km. of semi-desert terrain. It lies in the Barmer Basin, which is a northern extension of the well established oil and gas producing Cambay Basin. The total Rajasthan block gross resource base is estimated at 3.7bn boe, with 2P reserves (after EOR and assumption of ~10% recovery from other fields) of over 0.9bn boe, as illustrated in detail in Figure 16 below.

Figure 16. Rajasthan block – Gross 2P oil in place, reserves, and resource estimates

	STOIIP mmboe	Recovery factor (%)	2P Reserves to 2041	EOR Recovery factor (%)	EOR Contingent Resources	Total 2P Reserves + Contingent Resources
Mangala	1,202	36%	428	10%	120	549
Bhagyam[2]	468	30%	140	12%	56	196
Aishwariya	249	23%	56	8%	20	76
Sub-total 'MBA' fields	**1,919**		**624**		**196**	**822**
Smaller fields (Saraswati and Raageshwari)	298		8			8
MBA' fields + smaller fields	**2,217**		**632**		**196**	**828**
Other (smaller, low permeability) fields	1,443	8%	115*			115
Total	**3,660**					**945**

Source: Company Reports and Citigroup Investment Research estimates.
* Assuming ~8% recovery leading to potential 2P Reserves.

Cairn holds a 100% equity interest in the exploration area of the block. ONGC has, however, exercised its rights to take a 30% working interest in the development area associated with the commercial discoveries, leaving Cairn with a 70% working interest in the development area. Cairn is also the operator of the block.

'MBA' fields expected to produce at 150-160kbpd

The three main fields (Mangala, Bhagyam, and Aishwariya, collectively referred to as the 'MBA' fields or the Northern fields) are under development and expected to commence production in 2009. Bhagyam and Aishwariya are expected to commence production within one year of first oil from Mangala, and will be developed as satellite fields to Mangala. The combined projected plateau rates for the three fields will represent about 150-160 kbpd.

[2] Declaration of Commerciality was passed by Rajasthan Block Operating Committee (comprising JV partners ONGC, Cairn) in Feb 2006 and now awaits Management Committee (comprising JV partners and the representatives of GoI) approval

Figure 17. Cairn India – Northern Field Assets in Rajasthan

	Cairn interest (%)	Other stake holders	Production capacity (kbpd)	Expected commencement of production
Mangala	100 % (exploration phase), 70% (development phase)	ONGC (30% in development phase)	100-110	2H 2009
Bhagyam			30-40	1H 2010
Aishwariya			10-15	2H 2010
Total			**140-165**	

Source: Company Reports and Citigroup Investment Research estimates

Besides the Northern fields, Cairn has also made a number of other, albeit smaller, discoveries in the block. Significant among these are the Southern fields of Saraswati, Raageshwari Oil, and Raageshwari Gas, which are estimated to have a gross resource base of 298mmboe (2P reserves of 8mmboe). More importantly, the Raageshwari gas field is being developed as an important component of the development plan for the Northern fields (discussed in detail in the section titled '*Field Development Project*').

Of the 20 discoveries in Rajasthan, government approval for Field Development Plans (FDPs) of the Mangala, Aishwariya, Saraswati and Raageshwari have been approved whereas FDP for Bhagyam and Shakti will be submitted in 2Q07, with likely approval by end-2007. In the recent update, Cairn confirmed that the Bhagyam plateau production target will be 40kbpd and although reserve figures have also been upgraded, clarity on this would emerge only after the FDP is approved.

Cairn targets first commercial production by trucking from the Southern fields to commence by end-2007, following finalization of commercial terms of crude sales. That would also trigger the international arbitration process regarding the cess liability, with likely resolution by end-2008, well in time for the first oil from Northern fields.

Key terms of the PSC

We highlight some key terms of the Production Sharing Contract with the government below:

- State share determined based on Investment Multiple (IM), which is calculated as [Net Cash Income]/[Investment made to date]. The state take would vary based on the IM calculated for the year as shown in Figure 18.
- No signature bonus
- Cost recoverable on 100% of production
- 7-year tax holiday from 1st April in the year of first production

Figure 18. Rajasthan Assets – State Share

IM achieved	State share of profit oil (%)
0-1	20%
1-1.5	20%
1.5-2	30%
2-2.5	40%
2.5-3	50%
>3	50%

Source: Company Reports

II. Producing Assets

Total 2006 production from producing assets at 82,771 boepd

Cairn's primary producing fields are the Ravva, Lakshmi, and Gauri fields. The Ravva field is located in the PKGM-1 license area in the KG Basin and produced at approximately 50kbpd of oil and 70mmscfd of sales gas in 2006. The Lakshmi and Gauri fields are located in the CB/OS-2 PSC area in the Cambay

Basin and are primarily gas fields. The Lakshmi and Gauri fields produced about 100mmscfd of sales gas and 3.5 kbpd of oil and condensate in 2006. Cairn holds a 40% working interest in the CB/OS-2 PSC and a 22.5% working interest in the PKGM-1 license area.

Figure 19. Cairn India – Producing Assets

Producing Assets	Cairn Interest (%)	Other stake holders	Current production (gross) Oil (kbpd)	Gas (mmscfd)	Total (kboepd)
CB-OS-2 (Lakshmi + Gauri)	40% (operator)	ONGC (50%), Tata (10%)	3.5	98.5	21.2
Ravva	22.5% (operator)	ONGC (40%), Videocon (25%), Ravva Oil (12.5%)	49.7	71.4	61.6
Total			**53**	**170**	**83**

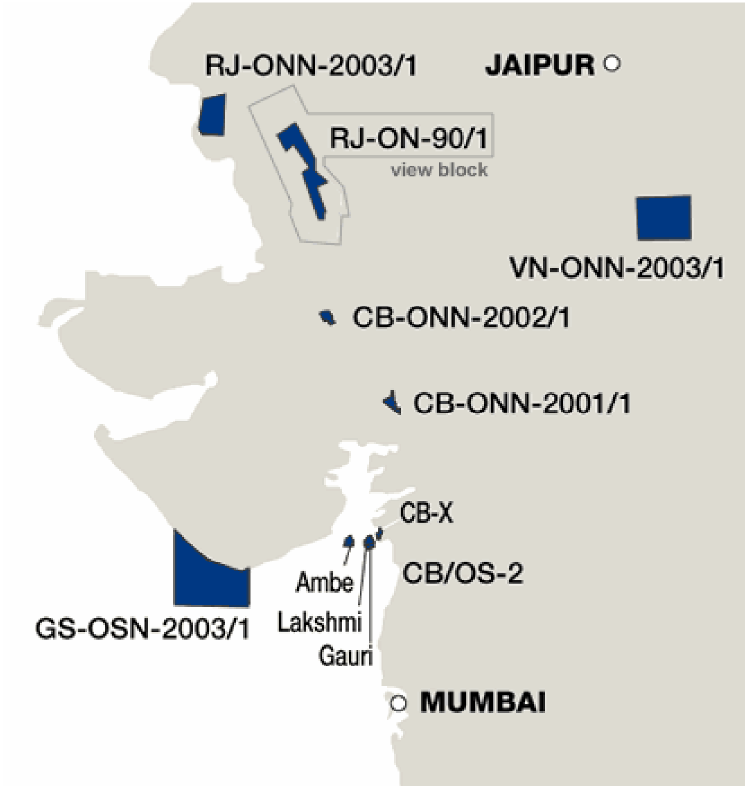
Source: Company Reports and D&M

1. CB/OS-2 (offshore Gujarat)

Only two fields in the block, Lakshmi and Gauri, have been declared commercial

Cairn operates Block CB/OS-2 in the Cambay Basin in offshore Gujarat on which it has made 4 oil and gas discoveries – Lakshmi, Gauri, Ambe, and CB-X. Lakshmi and Gauri have both been declared commercial and are producing, while the others are not yet producing.

Figure 20. Cairn India – Illustrative map of western India assets

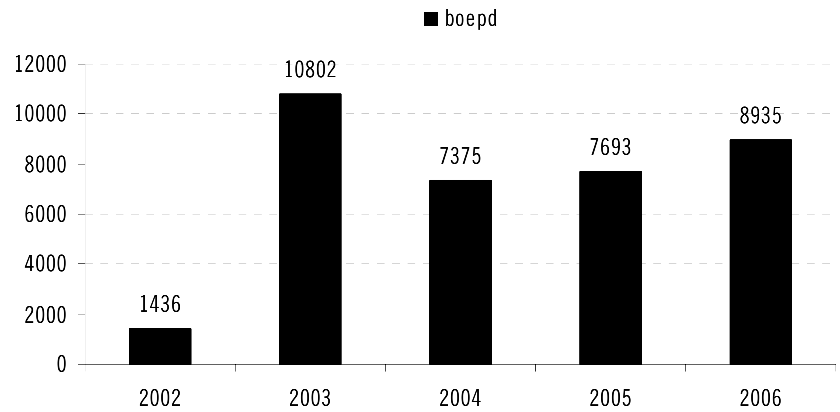


Source: Company website

Lakshmi and Gauri

The Lakshmi and Gauri fields, which are primarily gas producing fields but also produce some oil (c.15% of their total production), have both been declared commercial and commenced production in October 2002 and April 2004 respectively. These are the two main fields in the block and have been defined as distinct areas following declaration of commerciality.

Figure 21. Cairn India – CB/OS-2 net production entitlement (boepd)



Source: Company Reports

Production

The combined gas production from the Lakshmi and Gauri fields is now at around 80mmscfd, having declined ~30% from 1H07. Production is likely to decline further to around 70mmscmd before reaching plateau. The combined oil production from the fields is now around 3kbpd, where we expect it to plateau. Further investment in the fields is likely to increase the plateau oil production to around 6,000 bpd during 2008-10.

Pricing

Gas produced from the Lakshmi and Gauri fields is sold under two contracts to GPEC, Paguthan and Gujarat Gas Trading Corporation. The prices are linked to the trailing average of Brent and naphtha prices, with a floor and ceiling. Further, the pricing is subject to discounts based on certain quantitative and qualitative factors. The oil produced from the fields is sold at a c.US$10/bbl discount to Brent.

Key terms of the PSC

We highlight some key terms of the Production Sharing Contract with the government below:

Figure 22. CB/OS-2 Assets – State Share

PTRR achieved	State share of profit oil (%)
<15%	12.5%
<20%	22.5%
<25%	45.0%
<30%	50.0%
<35%	55.0%
>35%	60.0%

Source: Company Reports

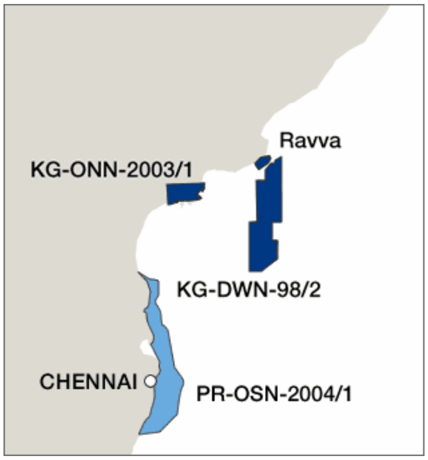
- State share determined based on post-tax rate of return (PTRR), which is calculated as [Income less Expenditure less Notional tax charge] compounded at the specified rate of return. The state take would vary based on the PTRR calculated for the prior year as shown in Figure 22.
- No signature bonus
- Cost recoverable on 100% of production
- 7-year tax holiday from 1st April of year of first production
- No royalty

Ambe and CB-X-1 (currently non-producing)

Ambe, a gas field, was discovered in 2001 and has been declared commercial in April 2006, with 2P reserves of ~6mmboe (as estimated by D&M). The FDP is presently under preparation. It is likely that the field will be developed as a satellite to the existing Lakshmi/Gauri infrastructure and in conjunction with ONGC's North Tapti development.

CB-X-1 was a successful well drilled in early-2004 confirming a small gas discovery to the North East of the Lakshmi/Gauri fields. The FDP was approved in March 2006 and development of gas is ongoing. Earliest production from the field is scheduled for 2007 and is anticipated at 3-5mmscfd.

Figure 23. Cairn India – Map of KG Basin Assets

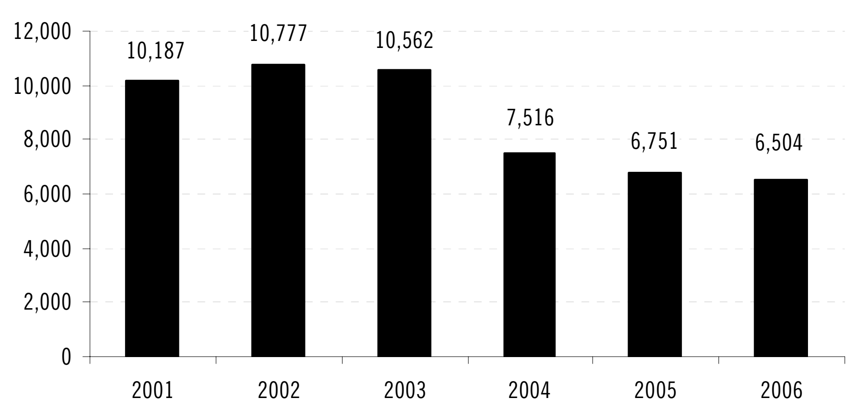


Source: Company website

2. PKGM-1 (Ravva)

Cairn developed the Ravva oil and gas field in the KG Basin in offshore eastern India during the 1990s. The Ravva field is currently producing oil at a plateau rate of approximately 50,000 bpd. Production takes place from a series of eight platforms that are connected to an onshore processing facility. Oil is then loaded on to tankers for transport to domestic refineries. Gas production is about 70mmscfd and sold to GAIL.

Figure 24. Cairn India – Ravva net production entitlement (boepd)



Source: Company website and reports

Maximum government stake of 60% has been reached

Production

Ravva oil production has been on plateau of 50,000 bpd for around seven years. Current planned investments will likely extend the plateau until end-2007 due to six new infill wells. We expect production from the field to begin to decline thereafter, due to natural field decline to the end of the license and also as the maximum value of state take (60%) was reached in 2006, reducing Cairn's entitlement volumes. We expect Ravva gas sales to decline to around 25mmscfd by 2010.

Pricing

The oil produced by the field is priced at a c.US$0.60/bbl discount to Tapis-Minas. The gas produced is sold under two contracts of roughly equal volumes. The pricing under both contracts is based on average of a specified crude oil basket, subject to floors and ceilings. The ceiling price under the two contracts was increased by 18% and 30% in 2006.

Key terms of the PSC

The Ravva field is one of Cairn's legacy assets from pre-NELP days. We highlight key terms below:

- State share determined based on post-tax rate of return (PTRR), which is calculated as [Income less Expenditure less Notional tax charge] compounded at the specified rate of return. The state take would vary based on the PTRR calculated for the prior year as shown in Figure 25.
- Cost recoverable on 100% of production
- Royalty of Rs481/MT, cess of Rs900/MT
- No tax holiday
- Production bonus – Cairn India and other members of the Ravva JV are obliged to make a series of production payments to ONGC based on cumulative crude oil production, as detailed in Figure 26 below.

Figure 25. Ravva Assets – State Share

PTRR achieved	State share of profit oil (%)
<15%	10.0%
<20%	15.0%
<25%	20.0%
<30%	25.0%
<40%	35.0%
>40%	60.0%

Source: Company Reports

Figure 26. Ravva PSC – Production Bonus Payments

Production	Gross payment owed to ONGC (US$m)	Net Payment by Cairn India (US$m)
For every 25 mmbbl upto 75 mmbbl	9.00	3.38
For every 5 mmbbl between 80-100 mmbbl	1.80	0.68
For every 5 mmbbl between 100-225 mmbbl	1.71	0.64
For every 5 mmbbl between 225-250 mmbbl	1.35	0.51
For every 5 mmbbl over 250 mmbbl	0.90	0.34

Source: Company Reports

III. Exploration Assets

Besides the producing and developing assets as described in the preceding sections, Cairn also has interest in 12 exploration blocks in India, as detailed in Figure 27 below. All the blocks where Cairn has a participating interest are onshore or shallow water blocks, with the exception of the deepwater KG-DWN-98/2 block (10%).

Figure 27. Cairn India – Exploration blocks

Blocks	Cairn Interest (%)	Operator	Mean Unrisked Prospective Resource (mmboe)	
			Gross	Net (WI)
GV-ONN-2002/1	50	Cairn India		
GV-ONN-1997/1	15	ONGC	176	58
GV-ONN-2003/1	24	Cairn India		
KG-DWN-98/2	10	ONGC	744	74
CB-ONN-2001/1	30	ONGC		
CB-ONN-2002/1	30	ONGC		
KG-ONN-2003/1	49	Cairn India	53	26
VN-ONN-2003/1	49	Cairn India		
GS-OSN-2003/1	49	ONGC		
RJ-ONN-2003/1	30	ENI		
PR-OSN-2004/1	25%	Cairn Energy India Pty Ltd		
KK-DWN-2004/1	40%	ONGC		

Source: Company Reports

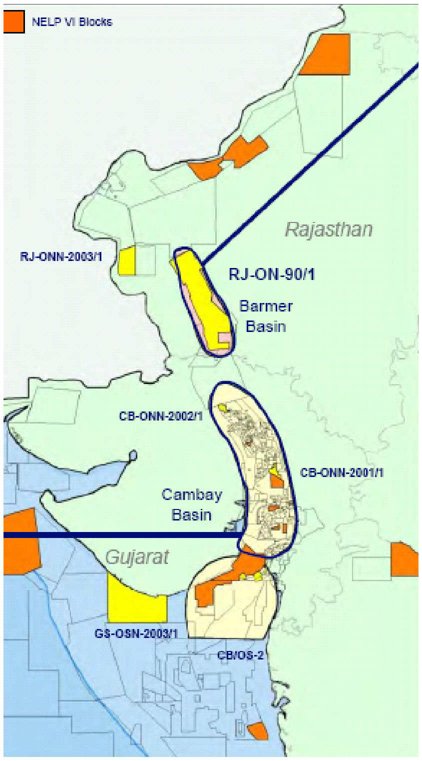
The three blocks in the Ganga Valley, GV-ONN-2002/1 (50%), GV-ONN-1997/1 (15%), and GV-ONN-2003/1 (24%), adjoin Cairn's Nepalese acreage. These are the only blocks in India where Cairn India will share equity with Cairn Energy PLC (to be split equally). Two blocks, CB-ONN-2001/1 (30%) and CB-ONN-2002/1 (30%) are situated in the Cambay Basin. Other blocks include VN-ONN-2003/1 (49%) in onshore Eastern Rajasthan in the Vindhya Basin, GS-OSN-2003/1 (49%) in offshore Gujarat in the Saurashtra Basin, and RJ-ONN-2003/1 (30%) in onshore Western Rajasthan in the Rajasthan Basin, all of which were awarded to Cairn in the NELP-V. Cairn India won two blocks in the NELP-VI round – PR-OSN-2004/1 in the Palar Basin as the operator and KK-DWN-2004/1 in the Kerala Konkan Basin with ONGC as the operator.

Exploration activity in 2007 restricted to existing blocks

Management has guided towards a total base-case exploration capex of ~US$150m over the next three years and US$80m in 2007. Cairn proposes to drill 10 exploration wells in 2007, most of them in producing/developing assets i.e. five in the Rajasthan block and two in Ravva. Three exploratory wells will be drilled in CB-ONN-2001/1 AND CB-ONN-2002/1. Most of the exploration activity in the remaining blocks (including the three blocks in Ganga Valley) is restricted to acquisition of seismic data with drilling scheduled for 2008.

Developing Rajasthan

Figure 28. Barmer – Extension of Cambay Basin



Source: Company Reports

The Rajasthan block (RJ-ON-90/1) comprises 6,688 sq. kms. of semi desert terrain. It lies in the Barmer Basin, which is a northern extension of the well established oil and gas producing Cambay Basin. Cairn acquired 100% exploration rights on the block from its partner Shell in 2002 (in a series of transactions, starting with a 10% stake in 1995). Following the commercial discoveries in the block, ONGC exercised its rights to take a 30% working interest in the development area. Cairn has 70% production interest post ONGC back-in.

Hydrocarbon reservoirs are made up of porous and permeable rocks that can hold significant amounts of oil and gas within their pore spaces. The properties of these rocks allow the oil and natural gas within them to flow through the pore spaces to a producing well. The key oil bearing reservoirs in the Rajasthan block are in the Fatehgarh sand formation in the north of the block (the Mangala, Bhagyam, and Aishwariya oil fields reservoirs are in this formation).

Figure 29. Cairn India – Discoveries in 2004

Prospect	Discovery	Timeline
NB-1	Mangala Field	mid January
NA-1	Aishwariya Field	March
NC-1	Shakti Field	April
NV-1	Bhagyam Field in	August
NR-1	Vijaya Field	September
NR-2	Vandana Field	November

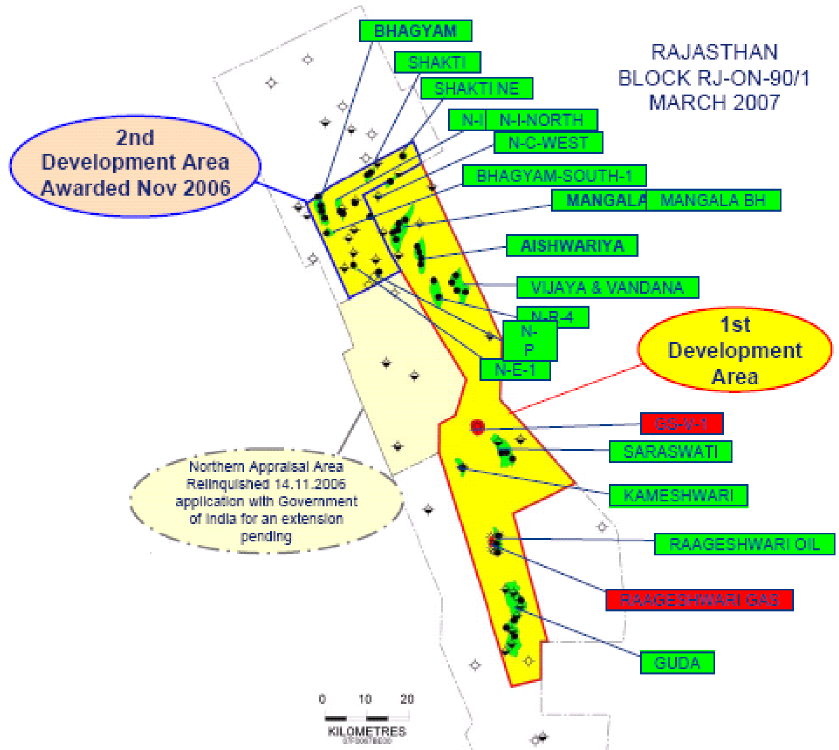
Source: Company website

The Shakti and Bhagyam field wells discovered hydrocarbons on the very northern edge of the contract area and under the terms of the PSC, enabled Cairn to apply for an extension of its exploration acreage to appraise the extent of these discoveries. Another 1,708 sq. kms was granted to Cairn for this.

The government of India declared the discovery commercial and granted Cairn development area of 1,858 sq. kms. including the Mangala, Aishwariya, and Saraswati fields and other discoveries (Guda, Kameshwari, and GR-F) in Oct 2004. Granting the development area secures rights till 2020 (extendable by five years) for these fields. Cairn has applied to extend this until 2041 in its Field Development Plan, which is in line with the assessed economic life of the field[3]. Cairn has also applied to secure additional development area (1,228 sq. km.) to secure the Shakti and Bhagyam fields as well as smaller Barmer Hill discoveries.

[3] The Rajasthan PSC does not have a single defined extension period but encourages mutual agreement for initial extension of five years and possible further extensions to as long as production remains economically viable.

Figure 30. Rajasthan – Block Overview

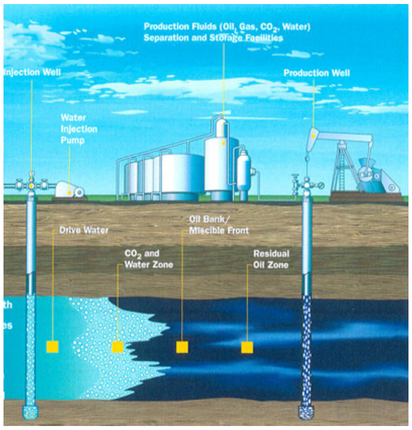


Source: Company Reports

Field Development Concept

Crudes from these fields are heavy (API varying from 26^0 to 29^0) and waxy, with a high pour point. Given these characteristics, the field development concept involves use of hot water flooding (to maintain the temperature of crude during extraction) and introduction of enhanced (tertiary) oil recovery techniques like polymer flooding with use of surfactants early in the field life. Hot water injection as an extraction technique is relatively new especially in the context of the size of Mangala development. It therefore makes reliability of heating and power generation utilities very critical besides increasing the operating cost (US$7-9 per incremental boe).

Figure 31. Oil Production using Water flooding



Source: American Petroleum Institute

Waterflooding is an established secondary recovery method, particularly for heavy viscous oils. Water is injected into the formation through injection wells, pushed through the formation and produced back through a different well. Replacement of voidage helps maintain reservoir pressure and hence the lift capability of producing wells. The produced oil will have water content, which is separated out before exporting the crude.

Waterflooding, however, leaves behind oil in the reservoir as water is immiscible with formation oil and the oil resists being displaced from the rock pores. Also, water density and mobility is incompatible with oil. Enhanced recovery techniques add chemicals to the water to overcome these problems. Polymer flooding uses the high-weight polymer molecules to increase the viscosity of injected water. This improves the mobility ratio of injected water to reservoir oil, resulting in a more effective displacement process and hence better recovery. In tertiary recovery, a surfactant is also sometimes used to 'wash' the oil from reservoir rocks.

Cairn's development plan for the Northern fields targets a 22-36% recovery factor assuming a secondary hot water flood. With Enhanced Oil Recovery (EOR) techniques (polymer flooding with use of surfactants), the recovery factor will be improved by a further 8-12%.

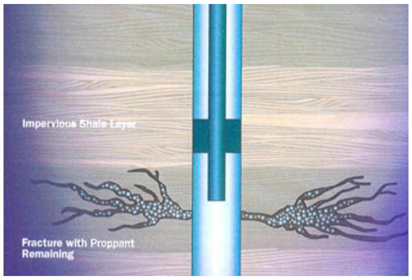
As per D&M estimates from the examination of similar fields operating elsewhere (such as Daqing in China and Minnelusa in Wyoming, US), polymer flooding could result in an incremental recovery over the base waterfloods of an additional 5-15%. If ASP flooding is proven viable instead of basic polymer flooding, incremental recoveries could increase to 12-22%. A limited polymer flood is planned for Mangala at the commencement itself, though challenges associated with sourcing of polymers and higher related costs will result in opex on the EOR boe to be US$7-9. However the potential for higher EOR recovery is one of the basis for the appraisal upsides as well as front-ended production profile in the sensitivity scenarios for the block.

Figure 32. Cairn India – Recovery Enhancement Through Tertiary Techniques

	STOIIP	Recovery Factor* (%)		Total Recovery
	mmboe	Water Flooding	EOR	
Mangala	1202	35.6	10	45.6
Bhagyam	468	30	12	42
Aishwariya	249	22.5	8	30.5

Source: Company Reports. * To 2041.

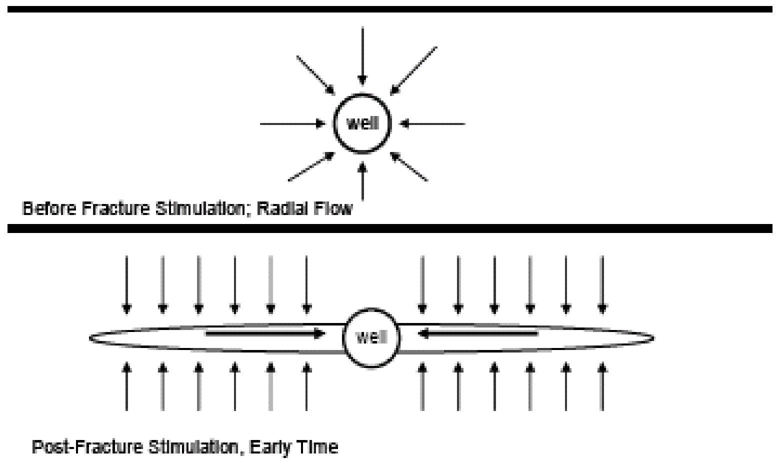
Figure 33. Fracture Stimulation



Source: American Petroleum Institute

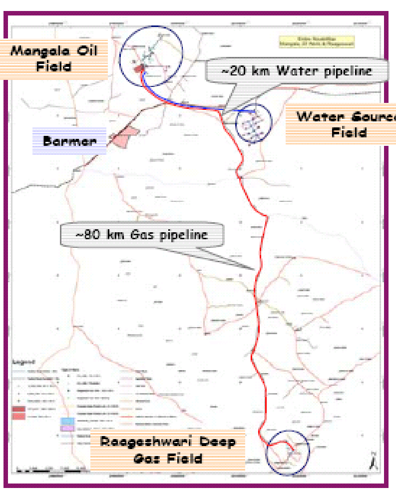
Fracture stimulation is another technique which improves well productivity. Fracture stimulation involves creating a fracture in the oil bearing rocks, thereby creating a 'highway' for the oil/gas to flow towards the well. Cairn is using hydraulic fracture stimulation to improve well productivity in Raageshwari Deep Gas reservoir. Hydraulic fracturing in other formations in Mangala and Aishwariya can also boost productivity and secure new reserves, which reflect in our appraisal upside.

Figure 34. Raageshwari Gas Fields – Fracture stimulation enhances flows



Source: Citigroup Investment Research

Figure 35. Mangala Development Project



Source: Company Reports

Field Development Project

Energy source: The development of the Raageshwari gas field in the south of the development area will be critical for the heating and power generation requirements of Northern field development. Gas from Raageshwari will be transported to the north through an 80km gas pipeline and be used as fuel to heat saline water. The total requirement of gas is 420 BCF i.e. 70mmboe (for MBA and Saraswati), which will be met by Raageshwari Deep Gas field (2P reserves of 36mmboe) and remaining from the associated Mangala gas.

Water source: Water source is from a saline aquifer on the block ~20kms from the Mangala field. The hot saline water will be injected into the oil bearing reservoir (waterflooding) in the Northern fields (Mangala, Bhagyam, and Aishwariya).

Southern fields: Cairn is also working on starting production from the Southern fields with the FDP already being approved; Saraswati production is likely to commence in end-2007 once the oil sale agreement is finalized with the government. Raageshwari oil field production is expected to start within 12 months of Saraswati. The first phase of development drilling has been successfully completed at Saraswati while it is now underway at Raageshwari. The initial crude evacuation will be through trucking (2,000-3,000 bpd), before setting up a product evacuation pipeline (production can be ramped up to 5,000-15,000 bpd at this stage). The peak production targets for the Northern fields are ~140-165kbpd (evacuated through pipelines).

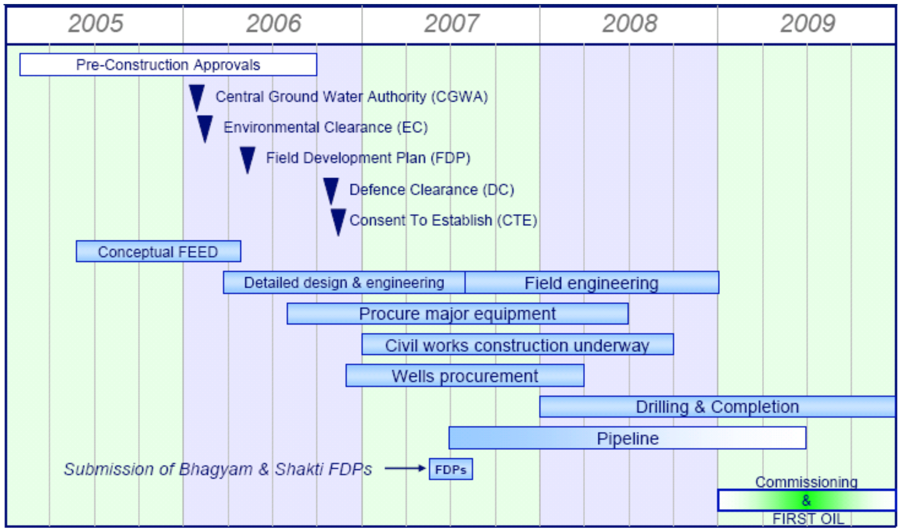
Figure 36. Cairn India – Northern field production capacities

	Production capacity (kbpd)	Expected commencement of production
Mangala	100-110	2H 2009
Bhagyam	30-40	1H 2010
Aishwariya	10-15	2H 2010
Total	**140-165**	

Source: Company Reports and Citigroup Investment Research estimates

Project schedule: All permits and permissions required to begin major construction work have been granted and Cairn India is in the process of procuring the major long lead equipments required to establish the production facilities. It plans to contract three purpose built rigs that will be used to drill the development wells. These rigs will allow drilling of the Mangala wells (some horizontal) and running completions. Detailed engineering designs for the Mangala development are progressing in Houston with consultants from Mustang Engineering Inc. (a subsidiary of John Wood Group Plc).

Figure 37. Rajasthan – Project schedule



Source: Company Reports

Capex and Funding

Cairn estimates a total life of field development capex of ~US$2.3bn for Rajasthan Block (on the approved and pending FDPs). Cairn has already spent US$680m on the Rajasthan block till end-2006. It expects future capex to be funded through a US$850m revolving credit facility, US$600m retention from the IPO proceeds, and internal funds.

Figure 38. Cairn India – Capex estimates for developing Rajasthan (US$m)

Field	To First Oil	Life of Field Development Cost
Mangala	860	1500
Bhagyam		500
Aishwariya		250
Raageshwari/Saraswati		45
Total		**2295**

Source: Company Reports

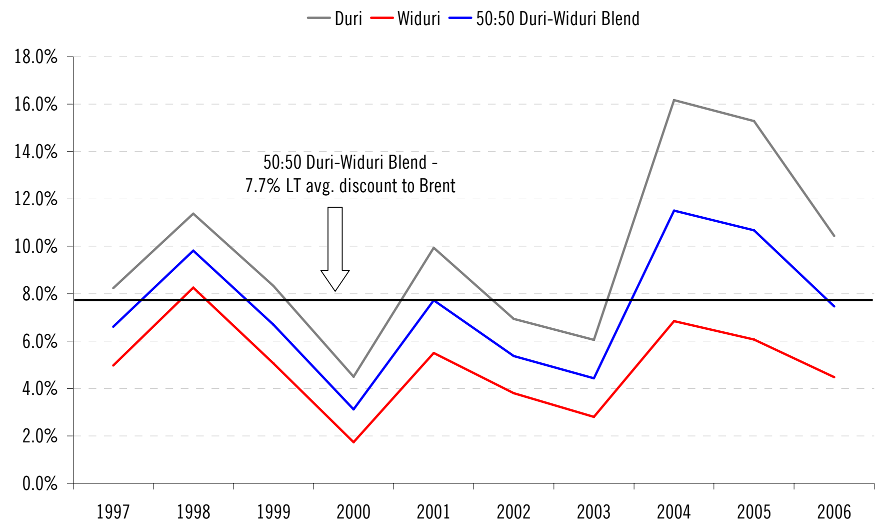
Crude Pricing and Commercial Issues

Rajasthan crude priced at a c.5-10% discount to Brent

Crude from the Rajasthan fields has high wax content, low sulphur, and an API of 27^0. The crude has characteristics similar to a blend of Indonesian crudes, Duri and Widuri, and should trade at a c.5-10% discount to Brent (see Figure 39 below). The PSC with the government states that international FOB price will be payable for the crude though the benchmarks which will constitute the basket are yet to be fixed (needs to be done only six months before commencement of production).

A few issues remain unresolved: 1) lack of progress by the nominated buyer for the crude (MRPL) in working out a midstream crude evacuation plan to get the crude to its refinery – this could lead to delays though Cairn is exploring alternatives to offset the risk; 2) final price payable is still under negotiation and there is no clarity on payment of cess (though this would be a recoverable cost under the PSC). Currently, our base case crude price assumption is based on a 7% discount to Brent with cess at Rs918/tonne assuming fiscal stability.

Figure 39. Duri-Widuri Crudes – Long-term discount to Brent



Source: Pertamina and Citigroup Investment Research

Midstream – An Irritant Rather than a Bottleneck

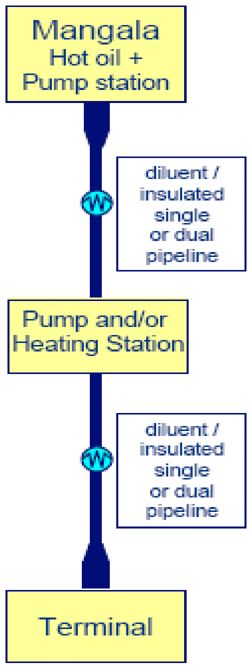
Lack of clarity on the midstream evacuation plan of MRPL (government nominated buyer for Rajasthan crude) is building into a potential bottleneck for development of the Rajasthan block, which could impact production timelines. The Production Sharing Contract with the government specifies that Cairn is to deliver the crude at a designated point within the Rajasthan development area and building facilities for midstream evacuation is the responsibility of the nominee (MRPL). MRPL, therefore, has the obligation to construct the pipeline to a port in Gujarat (Mundra) and ship the crude to its Mangalore refinery in the southern coast of India.

Given the apparent lack of progress in the MRPL's offtake plans and delay in executing the commercial agreement, Cairn is now exploring midstream evacuation options with a view to controlling development timelines as well as open up the option of marketing the crude directly in the Indian market. With large, high complexity refineries (Reliance, Essar) in the region, this could be a viable option for offtake of Cairn's heavy crude.

Cairn has therefore proposed a 531 km pipeline connecting Mangala-Viramgam-Salaya, which will give it access to multiple refineries through: 1) IOC’s existing pipelines; 2) private sector refineries of Reliance/Essar; and 3) other coastal refineries through the coastal route. Assuming pipeline capex of US$800m is cost recoverable as part of the PSC, the net impact on Cairn’s NAV is not material, assuming that Cairn can narrow the differential to crude to 5% from the 7% assumed in the base case. Specialist consulting engineers are assisting Cairn India in addressing the associated technical and commercial issues, while the conceptual engineering and route identification for the pipeline are at an advanced stage.

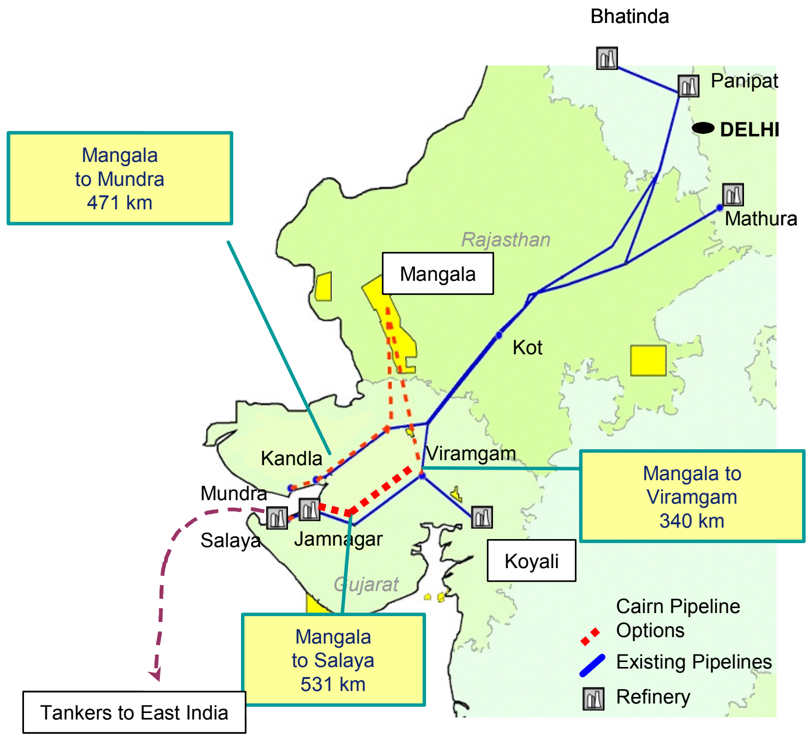
On a more macro level, given India's high dependence on imported crude (75%), ramp-up in domestic crude production will be viewed as strategically important and we do not expect the midstream issue to hamper production timelines materially.

Figure 40. Cairn India – Hot oil requires insulated pipelines



Source: Company Reports

Figure 41. Cairn India – Midstream evacuation options



Source: Company Reports

Financial Overview

Profit & Loss: Income statement for 2006 and beyond is based on 1H06 Indian GAAP accounts as provided in company disclosures for the three intermediate holding companies and our estimates for asset-wise production, revenues, and costs.

Figure 42. Cairn India – Income statement (Rs in millions)

Year to 31 December	2007E	2008E	2009E	2010E
Revenue	**8,174**	**6,937**	**22,722**	**60,184**
Production costs	1,296	1,174	2,280	5,050
DD&A	1,382	1,177	2,747	6,755
Exploration write-off	2,592	1,575	1,556	1,538
Gross Profit	**2,904**	**3,011**	**16,138**	**46,842**
SG&A	346	336	332	328
Operating Profit	**2,558**	**2,675**	**15,806**	**46,514**
Interest payable	475	1,008	1,660	1,980
Profit before taxation	2,083	1,667	14,146	44,534
Taxation	625	500	1,383	5,203
Profit for the Year	**1,458**	**1,167**	**12,763**	**39,331**

Source: Citigroup Investment Research estimates

Balance Sheet: We present our estimates of projected assets and liabilities (based on Indian GAAP), based on our assumptions of E&D expenses, depletion, and fund requirements beyond 2006. Two key points to note on the balance sheet forecasts:

- Estimate for cash includes the US$600m of IPO proceeds retained in Cairn India.
- Goodwill is created as a result of surplus of funds raised from IPO and Cairn PLC over the existing assets of Cairn India and the retained cash. Management has indicated that as per Indian GAAP they would not be amortizing goodwill and will instead only provide for impairment charges, which will be assessed every year.

Figure 43. Cairn India – Balance Sheet (Rs in millions)

Year to 31 December	2007E	2008E	2009E	2010E
Fixed Assets	**35,826**	**47,423**	**57,718**	**58,277**
- Pre-Producing Properties	2,617	2,041	2,016	1,992
- Net Producing Properties, Plant and Equipment	33,209	45,383	55,701	56,285
Goodwill	240,673	240,673	240,673	240,673
Cash	22,797	19,465	17,262	17,035
Net Current Assets	651	574	891	1,518
- Current Assets (excluding cash)	6,279	5,858	7,133	9,700
- Current Liabilities	5,627	5,284	6,242	8,182
Total Assets	**299,948**	**308,136**	**316,544**	**317,503**
Debt	8,640	16,800	24,900	24,900
Equity capital	17,653	17,653	17,653	17,653
Reserves and surplus	273,655	273,683	273,991	274,950
Total Liabilities	**299,948**	**308,136**	**316,544**	**317,503**

Source: Citigroup Investment Research estimates

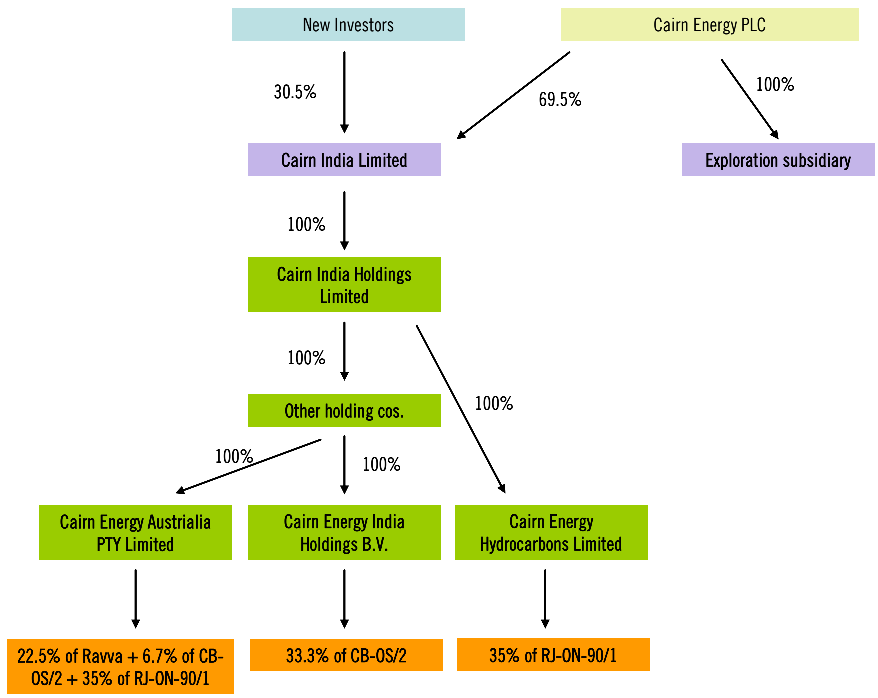
Appendix

I. Background

Cairn India was incorporated as a 100% subsidiary of Cairn Energy PLC (UK) to own and operate all of Cairn Energy PLC's oil and gas development and production, and a majority of the exploration assets in India. Cairn India has acquired 100% of the Indian assets (producing + under development) from Cairn Energy PLC. These assets and liabilities are now held in a number of companies, all of which are, directly or indirectly, wholly owned subsidiaries of Cairn India Holdings Ltd., an intermediate holding company of the Cairn Group.

Meanwhile, Cairn Energy PLC (through Cairn UK Holdings Ltd.) continues to hold a 69.5% stake in Cairn India, which funded the acquisition of the Indian assets with contribution from Cairn Energy PLC as well as the IPO.

Figure 44. Cairn India – Group corporate structure



Source: Company Reports and Citigroup Investment Research

The parent: Cairn Energy PLC is a Scotland-based oil & gas exploration and production company, with activities focused on South Asia. The company has exploration blocks, fields under development, and producing assets spread across India, Bangladesh, and Nepal. Cairn Energy PLC has extensive experience in South Asia with a strong track record in exploration and development (especially in India, having made three of the seven major discoveries since 2000).

Cairn Energy PLC has interests in four main PSC areas in India that are either producing or under development. The main producing fields are Ravva, Lakshmi, and Gauri. Besides, three significant oil discoveries in the Rajasthan block (RJ-ON-90/1) account for the bulk of Cairn's reserves, and the company expects to commence production in 2009.

The Rationale: Cairn India has been incorporated to focus on the development activities in India and the associated exploration opportunities in the existing as well as new blocks. Since the Indian operations (especially Rajasthan fields) will be transitioning to the development phase, Cairn India, in our view, would be able to leverage on its existing development experience as well as ensuring effective decision making at the local level. It would also enable Cairn Energy PLC to refocus its efforts towards exploration, which has been at the heart of its success so far.

Cairn India has signed a non-compete agreement with Cairn Energy PLC for bidding in new explorations assets in India (the agreement is for three years from listing, provided Cairn Energy PLC continues to hold at least 20% stake in Cairn India). Cairn India and Cairn Energy PLC will hold equal stakes in the three existing exploratory blocks in the Ganga Valley. Cairn India won two blocks in the NELP-VI round.

II. New Exploration Licensing Policy

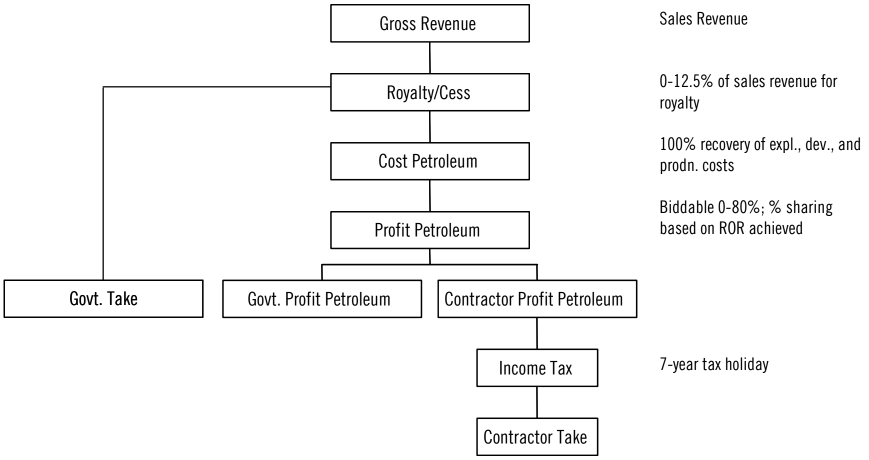
India's heavy dependence on crude imports (around 75% of its crude requirement is imported) and low levels of exploration (low well density per 1,000km) meant large capital investment both from the National Oil Companies (NOCs) as well as private-sector oil companies. Against this background, the New Exploration Licensing Policy (NELP) was formulated by the government in 1997-98 to provide a level-playing field in which all parties could compete for exploration acreage.

The sixth round of NELP (NELP-VI) was recently completed, offering 55 blocks (25 onshore, 6 shallow water, and 24 deepwater blocks). The successful bidder for each block will enter into a Production Sharing Contract (PSC) with the government. Some of the attractive features of the NELP are:

- No mandatory state participation, NOCs to compete for acreages
- Finalization of contract based on Model Production Sharing Contracts (MPSC)
- Foreign participation up to 100%
- No minimum expenditure commitment during the exploration period
- Freedom to sell crude and natural gas in the domestic market at market prices
- No customs duty on imports required for petroleum operations.
- Income Tax Holiday for seven years from start of commercial production
- No signature, discovery, or production bonus

- Option to amortize exploration and drilling expenditures over a period of 10 years from first commercial production
- Biddable cost recovery limit up to 100%

Figure 45. PSC Structure — Sharing cash flows



Source: Company Reports and Citigroup Investment Research

Cairn India

Company Description

Cairn India was incorporated as a subsidiary of Cairn Energy PLC (UK) to own and operate all of Cairn Plc's Indian E&P assets. Cairn India has operating interests in producing fields in KG Basin and the Cambay Basin offshore. However, most of reserves accrue from the Rajasthan Block where production commences in 2009. Post-IPO, Cairn Plc holds 69.5% in Cairn India.

Investment Thesis

We rate Cairn India Hold/Medium Risk with a target price of Rs145, based on NAV of cash flows and recovery & exploration upsides. Cairn India's ownership of valuable oil reserves in Rajasthan (OIP of 3.6bn boe) should generate steady cash flows from 2009, besides having potential to generate further upside from EOR and exploration. Cairn India's valuations are highly leveraged to crude relative to E&P peers, offsetting inherent operational risks. The risk-reward equation would likely turn at Rs120, which would adequately factor in operational risks without building in any upside from higher LT crude expectations. Meanwhile, potential success from 12 exploration blocks is sometime away.

Valuation

Our target price of Rs145 is based on NAVs of under-development and producing assets and peer comparison on traditional valuation multiples (EV/DACF). We prefer NAV to value its assets as it has long-term visible cash flows from its existing resource base, the value of which cannot be captured using traditional near-term earnings multiples. The key assumptions are: long-term crude price of US$50/bbl (Brent at US$47.5/bbl); first oil from Rajasthan in 2H09; crude realization at a 7% discount to Brent; cess at Rs918/MT; plateau production at 155-160kbpd; development capex of US$2.3bn and the impact of pipeline option. Our target price is quite leveraged to crude prices and less sensitive to operating parameters and/or reserve upside. The traditional valuation multiples (EV/DACF) will become more relevant as Rajasthan approaches first oil, but contingent on extent of exploration success.

Risks

Our quantitative risk rating system assigns a default Speculative Risk rating to Cairn India as the stock has traded for less than 12 months. However, we believe a Medium Risk rating is more appropriate despite it being in the project stage due to tangible oil reserves which can be monetized, strong track record of the parent, and favorable demand-supply for domestic crude. Key upside risks include a) higher than expected long term crude (Citigroup's WTI assumption at US$50/bbl) and b) further exploration upsides in the 12 blocks. Key downside risks include: 1) Delays and cost overruns; though cost recoverable, this could impact NAVs; 2) Unfavorable ruling on the cess liability being higher than our base case of Rs918/tonne and 3) Potential conflict of interest arising out of Cairn PLC 's majority ownership in Cairn India, especially in the context of the new exploration assets in India.

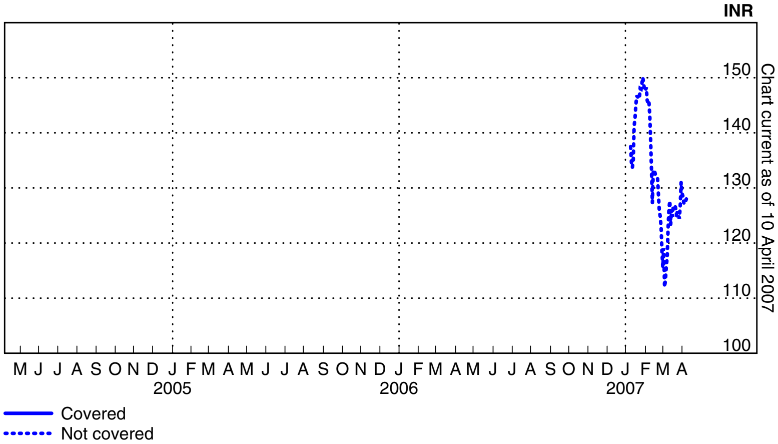
Appendix A-1

Analyst Certification

We, Rahul Singh and Pradeep Mirchandani, CFA, research analysts and the authors of this report, hereby certify that all of the views expressed in this research report accurately reflect our personal views about any and all of the subject issuer(s) or securities. We also certify that no part of our compensation was, is, or will be directly or indirectly related to the specific recommendation(s) or view(s) in this report.

IMPORTANT DISCLOSURES

Cairn India (CAIL.BO)
Ratings and Target Price History - Fundamental Research



#	Date	Rating	Target Price	Closing Price

*Indicates change.

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% of companies in each rating category that are investment banking clients	33%	0%	0%
Exploration & Production -- Europe (1)	100%	0%	0%
% of companies in each rating category that are investment banking clients	0%	0%	0%
Exploration & Production -- North America (16)	38%	56%	6%
% of companies in each rating category that are investment banking clients	67%	44%	0%
Hong Kong -- Asia Pacific (99)	58%	13%	29%
% of companies in each rating category that are investment banking clients	42%	38%	38%
India -- Asia Pacific (130)	58%	14%	28%
% of companies in each rating category that are investment banking clients	42%	50%	42%
Latin America (111)	44%	32%	23%
% of companies in each rating category that are investment banking clients	57%	42%	46%
Oil Companies--International -- Europe (11)	45%	45%	9%
% of companies in each rating category that are investment banking clients	80%	60%	100%
Oil Companies--Majors -- North America (7)	57%	43%	0%
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