

## Resource Plays: “What's the Upside? And How Much Should We Pay for Today?”

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The premise of this paper is that a superior understanding of emerging resource plays across Canada will be the primary driver of successful stock-picking in the foreseeable future. In an effort to quantify the potential “unbooked value” in emerging resource plays, Net Asset Value (NAV) has been categorized into three wedges: Core NAV, Risked NAV, and Unrisked “Bluesky” NAV. Unrisked NAV here represents a realistic view of what a company’s assets may be worth under the company’s pace of development in a best-case scenario, while the Risked NAV assesses how much of this upside ought to be paid for today. Underpinning the risked upside is the company’s booked Core NAV. The three wedges of NAV are illustrated in Figure 1.

- Core NAV: This wedge is Core after-tax NAV, which includes the 2P reserve valuation. A 9% discount rate is used.
- Risked NAV: The second stage is Risked NAV, which includes our Core NAV (2P reserve valuation) as well as the portion of unbooked resource potential that it is believed investors should consider paying for today.
- Bluesky NAV: The third stage is Bluesky NAV (or Unrisked NAV), which includes the Risked NAV in addition to the incremental valuation that is realistically obtainable by the company, but not yet concrete enough for investors to pay for today.

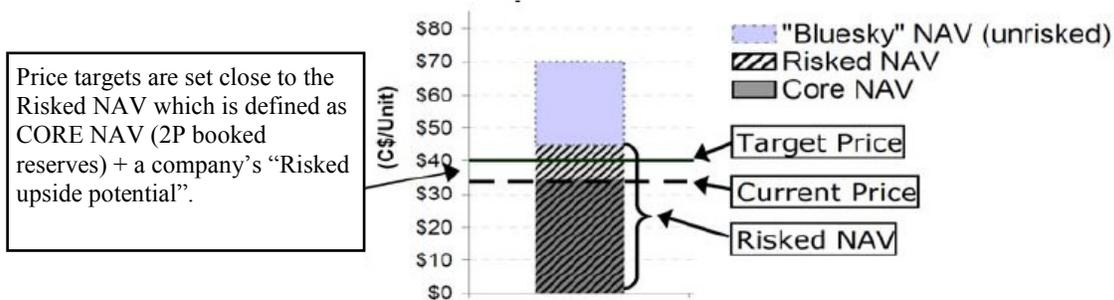
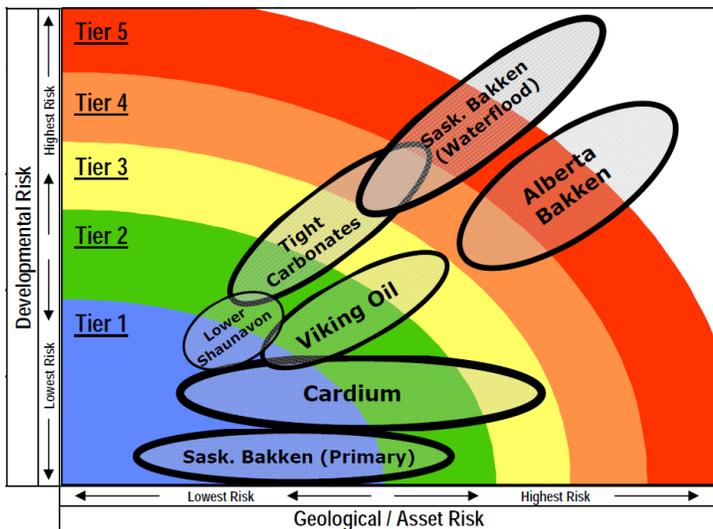


Figure 1: Risked NAV Simplified  
 Source: Company reports and CIBC World Markets Inc

The million-dollar question, in our opinion, is how does one set the threshold between Risked NAV and Bluesky NAV? That is, how do we assess how much we believe investors should pay for today and how much should be left on the table for the time being?

### Welcome To The “Matrix” – Demystifying Resource Potential

The de-risking matrix in figure 2 is a proposed framework for evaluating the risk of each of a company’s resource plays, allowing risk and magnitude to translate into quantified value for the company.



**Figure 2:** The “Matrix” Resource Play Risk Assessment Tool

Each play’s Geological/Asset Risk is plotted on the matrix against it’s Development Risk. As plays improve their “scores” in the criteria outlined in the developmental and geological/asset frameworks below, the plays become “de-risked” and shift from tier 5 towards tier 1, receiving greater credit in the Risked NAV.

**Geological/Asset Risk is comprised of:**

- 1) Knowledge of Geological Model
  - well control
  - seismic
  - pool analogues
- 2) Production History and Enhancability
- 3) Complexity of Geological Model
  - homogeneity of formation
  - nature/complexity of trap
  - completion Risk

**Development Risk is comprised of:**

- 1) Company specific risks
  - access to capital
  - concentration risk
  - “learning curve” risk
  - barriers to manufacturing stage
- 2) Hurdles to Commerciality/ Large Scale Development
  - infrastructure constraints
  - new technology required for feasibility
  - optimization desired for larger scale development
  - regulatory uncertainty
- 3) Commodity Downside Risk
  - nearness to breakeven commodity price
  - liquids vs. natural gas mix
- 4) Ongoing Operational Risk
  - Service access
  - Proximity to population
  - Potential service/labor constraints
  - Political and social risks

DE-RISKING TIERS (For Risked NAVs)					
Years in Future	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
	← Lowest Risk		Highest Risk →		
1	90%	75%	60%	40%	10%
2	80%	60%	50%	30%	10%
3	70%	50%	40%	25%	10%
4	60%	40%	30%	20%	10%
5	50%	30%	25%	15%	10%
6	40%	30%	25%	15%	10%
7	35%	30%	25%	15%	10%
8	35%	30%	25%	15%	10%
9	35%	30%	25%	15%	10%
10	35%	30%	25%	15%	10%
11	35%	30%	25%	15%	10%
12	35%	30%	25%	15%	10%
13	35%	30%	25%	15%	10%
14	35%	30%	25%	15%	10%
15	35%	30%	25%	15%	10%

**Figure 3.** De-risking tiers, are then correlated with cascading risking percentages which are applied to drilling inventories on a year-by-year basis. Risking not only becomes more punitive in the higher risking tiers (where riskier plays are placed) but is also more punitive for wells drilled further into the future. The additional “time risking” in each tier is incremental to our 9% discount rate, and is justified by basic assumptions such as the notion that companies drill their best wells first, down-spacing wells are typically less productive, and, empirically, investors are less inclined to pay for wells drilled 5 years from now then for wells expected to be drilled in a year.

Once each play has been ranked on the Matrix and a Tier assigned, the contribution to the risked NAV is calculated using the following assumptions: NPV/well, prospective net sections, wells per section, initial wells per year, optimal wells per year and years to optimal pace and optimal years to develop inventory. A theoretical company’s Cardium play analysis follows:

**Cardium (CAN)**

**Assumptions:**

NPV/well - Midcycle (\$M)	A-Tax : 2.4	B-Tax : 4.1
Risking Tier (1 to 5)	2	

Net Sections	149
Prospectivity	100%
Prospective Sections	149
Wells per Section	4
Max Well Inventory	596
RISKED Well Inventory	202

Initial # Wells/yr (company)	10
Optimal # Wells per Year	60
Years to Optimal Pace	5
Optimal Years to Dev. Inventory	10

YEAR	RISK timeline (TIER 2)
1	75%
2	60%
3	50%
4	40%
5	30%
6	30%
7	30%
8	30%

Resource (MMBoe)	
(UnRisked)	(Risked)
104	35

Drilling Inventory

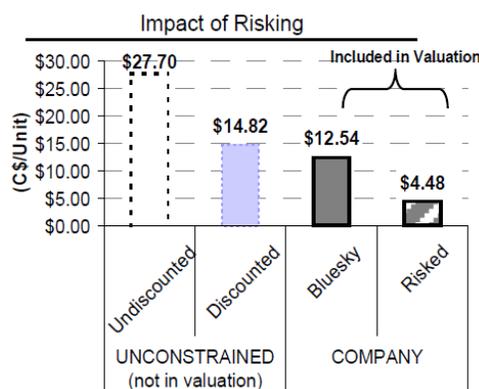
YEAR	Unconstrained Pace		Company Pace	
	Undiscounted (wells/yr)	Discounted (wells/yr)	Bluesky (wells/yr)	RISKED (wells/yr)
1	596	60	10	8
2		60	23	14
3		60	35	18
4		60	48	19
5		60	60	18
6		60	60	18
7		60	60	18
8		60	60	18
Total	596	596	596	202

Risked Valuation

YEAR	RISK timeline (TIER 2)	Unconstrained Pace		Company Pace	
		Undiscounted NPV/yr (\$M)	Discounted NPV/yr (\$M)	Bluesky NPV/yr (\$M)	RISKED NPV/yr (\$M)
1	75%	\$2,444	\$188	\$31	\$23
2	60%		\$172	\$65	\$39
3	50%		\$158	\$92	\$46
4	40%		\$145	\$115	\$46
5	30%		\$133	\$133	\$40
6	30%		\$122	\$122	\$37
7	30%		\$112	\$112	\$34
8	30%		\$103	\$103	\$31
Total		\$2,444	\$1,307	\$1,106	\$395

Resource (MMBoe)	
(UnRisked)	(Risked)
104	35



By combining this analysis for each play in a companies inventory a “Risked NAV” per share can be calculated for a company that more realistically portrays the potential value and target share price (Figure 1).