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Steyer-Taylor Center for  
Energy Policy and Finance

# Climate Exposure Impact on Equity Valuation: Case Study of Vail Resorts, Inc.

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# Executive Summary

Climate exposure for investors refers to potential gains or losses in a portfolio due to climate change.<sup>1</sup> To effectively manage this exposure, investors first need to accurately quantify and measure the potential impact. Unfortunately, the unpredictable nature of the risk and complexity of obtaining data have made the task difficult in practice. Most of the environmental data available for investors is historical or challenging to quantify financially so investors are not able to meaningfully incorporate it into forward-looking, fluid investment decisions. In addition, the challenge of effectively measuring climate exposure in a portfolio requires a unique approach for each sector and company.

Our model introduces a methodology to analyze the financial impact of climate exposure on a public company's equity valuation. This climate exposure analysis differs from ESG (environmental, social and governance) and low-carbon portfolio tools because it measures near-term (three-five year) impact on equity valuation from climate change and related innovation, mitigation or adaptation. ESG tools typically generate qualitative ratings for each company rather than a quantitative value to apply to equity valuations, and low-carbon analysis tends to focus on longer-term potential financial impact (like stranded assets).

Utilizing Vail Resorts, Inc. (MTN) as an example, the model incorporates the financial impact from changes in snowfall, associated increased snowmaking costs, and energy efficiency improvements. Vail Resorts provides a glimpse into a company dealing with the direct, present-day impact of changes in climate without being too geographically or financially complex. The research integrates climate change into MTN's investment valuation and demonstrates that climate exposure risk and opportunity can be quantified.

## Purpose of Measuring Climate Exposure for Investors

Climate risk presents a unique challenge to measure and isolate as an alpha-generating variable. As a result, many investors have considered climate risk in the past for reasons primarily disconnected from the goal of outperformance. Such reasons include a moral argument for divestment, response to stakeholder pressure, and the desire to differentiate an organization or product. Many large institutional investors are starting to establish investment principles that promote active engagement on ESG issues, but have not yet determined how to effectively integrate it into an investment decision to generate alpha. CalPERS created a set of ten investment beliefs that includes the idea that long-term value creation requires engagement of external managers and companies on ESG issues. Yale's \$20.8 billion endowment encourages active engagement by asking its external managers to discuss financial risks of climate change

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<sup>1</sup> CPI, February 2015

with company management teams. Our model illustrates that investors can track climate risk and that it represents a material financial element in the investment decision. The analysis illuminates a more comprehensive way of measuring climate exposure that can be integrated into equity and fixed income financial models in addition to the existing qualitative management tools.

## **Proposed Model**

The model detailed in this paper illustrates the impact of climate exposure on financial statements and equity valuation utilizing MTN. For MTN, climate exposure from changes in snowfall, water scarcity, rising energy costs and energy efficiency improvements are near-term risks and opportunities that must be factored into an investment decision. The model compares financial estimates from a traditional equity valuation analysis (that does not specifically consider climate exposure) with financial estimates generated using a climate exposure analysis. The analysis uses both equity multiples and discounted cash flow valuation techniques.

## **Background on Vail Resorts and Ski Industry**

MTN, the largest publicly-owned ski resort operator in North America, owns 9 properties in Colorado, California and Utah, and two small “urban” resorts outside Detroit and Minneapolis. (Attachment 1). Management most recently acquired the two Utah resorts, Canyons and Park City, in May and September 2014 respectively. MTN also owns and operates luxury hotels, condominiums and a transportation service and develops real estate near its resorts.

MTN and other ski resort operators contend with the impacts of changing weather patterns every year, as rising temperatures and declining snowfall have driven them to find ways to adapt and change to remain profitable. MTN’s California resorts, for example, have suffered through a three-year unprecedented period of drought (2012-14) and have experienced annual snowfall totals less than 60% of average. The 2013-14 ski season saw California snow total only 29% of average.<sup>2</sup> Research has shown this is not a temporary weather phenomenon and can be expected to continue. A team of Stanford researchers found that the probability of atmospheric conditions similar to those that caused this most recent California drought has increased by at least three times due to human emissions of greenhouse gases.<sup>3</sup>

MTN has been aggressively expanding its summer resort activities to help balance the seasonality, yet winter quarters still generate 100% of its profit. As a financial tool to mitigate

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<sup>2</sup> Weather-Warehouse.com. “Past Weather Data for Tahoe City, CA: January 1903-2015.”

<sup>3</sup> Swain, Daniel L., Diffenbaugh, Noah, Rajaratnam, Bala. “Atmospheric Conditions Associated with the 2013-14 California Drought Are ‘Very Likely’ Linked to Human-caused Climate Change.” Stanford Woods Institute for the Environment, Fall 2014.

the volatility of winter revenue from weather changes, MTN markets its \$729 Epic Pass. The pass provides unlimited seasonal access to all of MTN's resorts plus several international partner mountains, and locks up a significant amount of revenue in the preseason. Epic Pass sales account for over 40% of lift ticket revenue.

MTN has invested heavily in snowmaking equipment to offset its exposure to warmer weather, lower snowfall and shorter ski seasons. However, energy costs are typically the second highest cost for a ski resort (behind labor costs), and are primarily driven by snowmaking. Estimates show energy usage comprises between 15-25% of a resort's total operating costs, and snowmaking and other on-mountain use makes up over 50% of that amount.<sup>4</sup> Ski resort operators are incented to find more efficient and lower cost snowmaking methods to replace older, energy intensive equipment.

Water resources are another critical environmental issue for ski resort operators, since snowmaking operations consume enormous amounts of water. A typical ski run of 200 feet wide with a drop of 1,500 feet would need three acre-feet of water (over 400,000 gallons) to make one foot of snow.<sup>5</sup> Despite the exorbitant amount of water needed, most of a ski resort's water usage is labeled non-consumptive because roughly 80% of the water is returned to the water source during spring run-off.<sup>6</sup> The critical issue is access to adequate supplies of water – most ski resorts' highest demand for water occurs when supplies are lowest, at the end of summer and early fall. MTN has resolved most of its water supply issues by purchasing water rights (which guarantee access and removes much of the uncertainty) and building storage reservoirs to store water during peak run-off. The company does not own water rights in California and could suffer interruptions to its snowmaking at some point in the future. Interruption of water availability was not factored into the model since it does not appear to be a near-term risk, even with the record three-year drought.

### **Methodology and Findings**

The study began by performing a traditional equity analysis of the company similar to those generated by Wall Street analysts (Attachment 2). The analysis utilized public data available in financial statements, company presentations, Bloomberg and earnings reports. MTN publishes a significant amount of detailed financial data, including the number of skier visits to its resorts, revenue by segment (lift ticket revenue, ski school, dining, retail) and estimates of future performance. MTN's frequent acquisitions over the past five years make it difficult to assess organic growth or decline in performance; the model adjusted certain metrics to remove the

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<sup>4</sup> Ward, Bob. The Aspen Times. "Vail: Bigger Resort, Smaller Footprint." December 17, 2013

<sup>5</sup> University of Washington, College of the Environment: Impacts of Climate Change on the Economic Viability of Selected PNW Ski Areas

<sup>6</sup> Flynn, Casey. "Cost of Snowmaking." Xgames.espn.go.com/skiing, Website.

impact of these acquisitions. **The traditional discounted cash flow analysis generated an equity valuation of \$97.05 per share**, based primarily on company guidance for skier visits, season lift ticket sales and growth from recent acquisitions of Park City and Canyons resorts. This represents a premium of 13.2% over the current stock price of \$85.70 and an indication that the equity is presently undervalued by the market.

Next, a second equity analysis was performed that incorporated MTN's climate exposure into an alternative equity valuation. Much of the data for determining the company's climate exposure came from sources other than the company's financial statements or press releases due to lack of adequate disclosure (MTN does not self-report climate risk data such as carbon emissions or energy usage). The externally-farmed data proved tedious to find and calculate, and included historical snowfall and temperatures in Tahoe City, California and Vail, Colorado, ski season average length, snowmaking cost and water usage.

Public annual snowfall data for individual mountain resorts could only be found dating back to 2008, so the analysis instead used snowfall data for the nearby cities of Vail and Tahoe City from the National Weather Service. Over the last 20 years, annual snowfall in Vail and Tahoe City has trended downward (see Attachment 3), illustrating the long-term effect of changes in climate. Although annual snowfall is difficult to predict, the downward trend needs to be factored into a climate exposure valuation of any Colorado or California ski resort. Based on regression analysis, annual snowfall totals in both Vail and Tahoe City were highly correlated to the number of skier visits to MTN properties in Colorado and California (Attachment 4). MTN's revenue is primarily driven by the number of skier visits, making the correlation with snowfall a significant climate exposure element to consider. The model also found a moderate correlation between operating costs and changes in snowfall – in seasons with lower snowfall totals, operating costs go up to account for higher snowmaking and other costs.

Adaptation measures like innovation and energy efficiency were also integrated into the climate exposure equity valuation, but were more difficult to calculate based on minimal public information available. MTN does not provide energy or water usage in its public disclosures, nor does it break out energy costs as a percentage of overall operating costs. The company publicized a 10% reduction in energy use between 2008-2012, and has announced a goal of an additional 10% reduction by 2020.<sup>7</sup> As MTN replaces older snowmaking equipment with high efficiency machines, energy usage declines significantly. In 2013, the company replaced 15 older air compressors at Vail and Beaver Creek with a new high-powered compressor at each ski resort. The new equipment, used to power snowmaking machines, uses half the power and delivers 30% more compressed air than the replaced equipment.<sup>8</sup> To estimate future cost savings from this more efficient snowmaking equipment and other energy improvements, the model extrapolated data based on total skiable acres, MTN's energy use reduction goals, and company

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<sup>7</sup> Vail Resorts, Inc. Press Release. "Vail Resorts Announces the Company Achieved Its 10 Percent Energy Layoff Goal and Sets 'The Next 10 Percent' Energy Reduction Goal for 2020." March 1, 2012

<sup>8</sup> Ward, Bob. "Vail: Bigger Company, Smaller Footprint." The Aspen Times, December 17, 2013.

energy cost and usage disclosures found in the press. The company will save over \$2 million in 2015 and over \$8 million in 2019 by meeting its energy reduction goal (or more if gas prices rise significantly), a positive climate exposure factor.

MTN does not provide any quantitative disclosure on water usage – only qualitative information on owned water rights and other agreements in its 10K - making it impossible to accurately assess the quantity of water utilized in its operations.

**The climate exposure discounted cash flow analysis generated an equity valuation of \$83.85, 13.6% lower than traditional analysis valuation and 2.2% lower than the current equity price.** One notable explanation for the difference in prices: the climate model valuation assumes a 30% decline in California snowfall year over year in 2015 and a 6% decline in Colorado snowfall (based on season totals through January 2015).<sup>9</sup> The climate model also assumes California snowfall remains below the long-term average for the foreseeable future.

The climate exposure equity model illustrates that climate change for MTN and the ski industry needs to be addressed in current valuations, and the financial impact can be measured. Despite efforts by MTN to offset the impact of lower snowfall on its valuation (by selling Epic Passes, increasing summer resort offerings, investing more in higher efficiency snowmaking equipment, and other methods), climate change negatively affects its financial performance. Equity valuations for MTN that ignore climate change implications risk overestimating the company's value.

## **Conclusions:**

- Climate exposure is both a near-term and longer-term valuation issue for MTN and the ski industry, with measurable financial impact.
- The methodology utilized in this model can be applied to other companies and industries. For example, a climate exposure analysis for a fast food company would consider some of the same elements as this analysis (energy usage, percentage of costs attributed to energy, energy efficiency improvements, and water usage) and then substitute beef for snow. Fast food restaurants have been contending with record high beef prices as a result of drought and dry conditions in Texas and Oklahoma. Many industries outside of the energy sector and utilities have material climate exposure as a result of changing resource availability, extreme weather, labor productivity, and real asset risk (sea and flood level impacts).

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<sup>9</sup> [www.onthesnow.com](http://www.onthesnow.com). "Vail Historical Snowfall." November 2014-February 2015.

- Investors need more accurate data to be able to assess the positive and negative impacts of climate change on investments. SASB (Sustainability Accounting Standards Board) has made significant progress with standardizing data requirements by industry but corporate disclosure remains voluntary and largely inadequate.
- Public equity and bond investors need to continue demanding better disclosure on adaptation, mitigation and other climate financial impacts from public companies.

*Many industries have material climate exposure as a result of changing resource availability, extreme weather, labor productivity and real asset risk (sea and flood level impacts).*

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**Attachment 1**



Ticker: **MTN**

**Vail Resorts Inc (New York: MTN, Currency: USD)**

Sector: **Consumer Discretionary** Industry: **Hotels Restaurants & Leisure** Sub-Industry: **Leisure Facilities**

Website: [www.vailresorts.com](http://www.vailresorts.com)  
 Number of Employees: 4,300  
 Ticker: MTN US

390 Interlocken Crescent Broomfield, CO 80021 United States  
 Phone : 1-303-404-1800  
 Fax : 1-303-404-6415

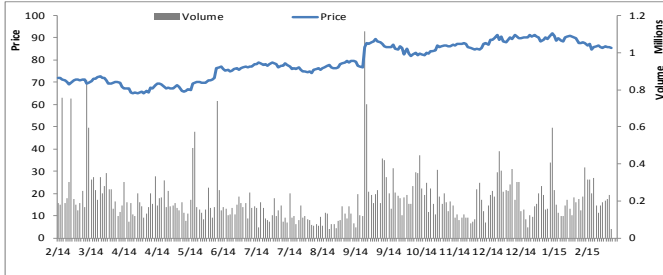
85.70

**Business Description**

Vail Resorts, Inc. operates resorts in Colorado. The Company's resorts include Vail Mountain, a ski mountain complex, and Beaver Creek Resort, a family oriented mountain resort. Vail Resorts also operates Breckenridge Mountain, a destination resort with apres-ski activities, and Keystone Resort, a year-round family vacation destination.

**Stock Quote & Chart (Currency: USD)**

Last (delayed quote)	85.70	Market Cap (MM)	3,108.7
Open	85.69	Shares Out. (MM)	36.3
Previous Close	85.90	Float %	99.0%
Change	0.18	Shares sold short (MM)	880,677.0
Change %	0.21	Dividend Yield %	1.9
Day High/Day Low	86.3 / 85.3	Diluted EPS Exd. XO	0.9
52 Wk High/52 Wk low	94.2 / 64.5	P / Diluted EPS Before XO	92.0
Volume (MM)	0.05	Beta	0.95
Avg. Vol - 3 mo (MM)	0.22		

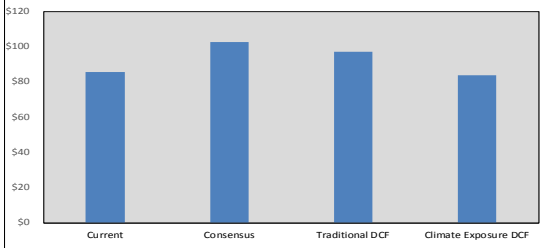


**Financial Information (Currency: USD, in mm)**

Revenue - LTM	1,259.5	Cash & ST Invst.	44
EBIT - LTM	130.5	Total Assets	2,173.8
EBITDA - LTM	272.9	Total Debt	626.6
Net Income - LTM	37.6	Total Liabilities	1,339.0
Total Enterprise Value	4,041	Total Equity	834.8
TEV / Total Revenue	3.1 x	Cash from Operations - LTM	241.1
TEV / EBITDA	14.4 x	Cash from Investing - LTM	-280.9
		Cash from Financing -LTM	-44.6

Source: Bloomberg data above this line

**MTN Equity Price Comparison**



**Recommendation**

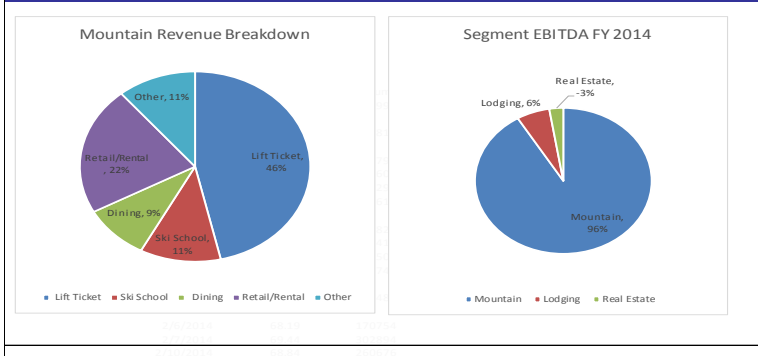
**Traditional Model Overweight**  
 Price target: \$97.05 (DCF) \$105.50 (multiple)  
 Based on current stock price of \$85.70, the company appears undervalued. Despite the continued record-low snowfall in California, MTN's Colorado and Utah resorts appear to be capitalizing on increased destination travelers and higher per-skier revenue.

**Climate Model: Underweight.**  
 Price targets: \$83.85 (DCF) \$87.20 (multiple)  
 Based on current stock price of \$85.70, Vail Resorts is overvalued when the impact of climate exposure is factored into the equity valuation. Year-to-date snowfall is lower year-over-year in both Colorado and California, which has not yet been fully factored into traditional equity valuations of the company.

**Financial History**

For the Fiscal Period Ending:	Actuals						Traditional Model			Climate Exposure Model		
	7/31/2009 USD	7/31/2010 USD	7/31/2011 USD	7/31/2012 USD	7/31/2013 USD	7/31/2014 USD	7/31/2015E USD	7/31/2016E USD	7/31/2017E USD	7/31/2015E USD	7/31/2016E USD	7/31/2017E USD
Total Revenue	977.0	894.8	1,167.0	1,024.4	1,120.8	1,254.6	1,634.6	1,826.9	1,918.3	1,558.7	1,594.9	1,659.4
Growth Over Prior Year	(15.2%)	(8.4%)	30.4%	(12.2%)	9.4%	11.9%	30.3%	11.8%	5.0%	24.2%	2.3%	4.0%
Gross Profit	214.4	174.5	215.5	188.4	224.2	260.5	340.0	380.0	399.0	303.9	331.7	353.5
Margin %	21.9%	19.5%	18.5%	18.4%	20.0%	20.8%	20.8%	20.8%	20.8%	19.5%	20.8%	21.3%
EBITDA	213.3	179.9	212.4	186.9	229.6	257.9	340.0	380.0	399.0	303.9	331.7	353.5
Margin %	21.8%	20.1%	18.2%	18.2%	20.5%	20.6%	20.8%	20.8%	20.8%	19.5%	20.8%	21.3%
Net Income	49.0	30.4	34.5	16.5	37.7	28.5	99.7	123.6	130.3	73.2	87.9	96.7
Margin %	5.0%	3.4%	3.0%	1.6%	3.4%	2.3%	6.1%	6.8%	6.8%	4.7%	5.5%	5.8%
Diluted EPS Excl. Extra Items	1.3	0.8	0.9	0.5	1.0	0.8	2.7	3.3	3.5	2.0	2.4	2.6
Growth Over Prior Year	(49.6%)	(37.6%)	13.3%	(52.1%)	128.9%	(25.2%)	249.5%	23.9%	30.7%	1.6%	0.2%	0.1%
Total number of skier visits:	5,902.0	5,988.0	7,000.0	6,200.0	6,977.0	7,688.0	8,954.0	9,266.0	9,266.0	8,727.8	8,816.7	9,087.3
Growth Over Prior Year	(4.0%)	1.5%	16.9%	(11.4%)	12.5%	10.2%	16.5%	3.5%	0.0%	13.5%	1.0%	3.1%
Effective Ticket Price	47.16	48.13	48.99	55.75	56.02	58.18	60.45	61.66	62.89	60.45	61.66	62.89
Growth Over Prior Year		2.1%	1.8%	13.8%	0.5%	3.9%	3.9%	2.0%	2.0%	3.9%	2.0%	2.0%
Change in Vail, CO snowfall yoy	(24.8%)	(5.9%)	27.0%	(56.7%)	29.8%	44.3%	0.0%	0.0%	0.0%	(6.0%)	0.0%	20.0%
Change in Tahoe, CA snowfall yoy	(1.5%)	24.7%	35.3%	(62.4%)	5.2%	(50.9%)	0.0%	0.0%	0.0%	(30.0%)	10.0%	150.0%

**Segment Detail**



**Resort Breakdown**

	Skiable Acres	Est. Annual # Skiers	% of total skier visits	Yrly Avg Snowfall (in)
<b>Colorado Resorts:</b>				
Vail	5,289			354
Breckenridge	2,908			353
Keystone	1,861			235
Beaver Creek	1,625			325
<b>Total CO</b>	<b>11,683</b>	<b>5,500</b>	<b>62%</b>	
<b>California Resorts:</b>				
Heavenly	4,800			360
Northstar	3,170			350
Kirkwood	2,300			600
<b>Total CA</b>	<b>10,270</b>	<b>1,400</b>	<b>16%</b>	
<b>Utah Resorts:</b>				
Canyons	3,500			355
Park City	3,300			
<b>Total UT</b>	<b>6,800</b>	<b>1,200</b>	<b>14%</b>	
<b>Resorts:</b>				
Urban	430	788	9%	
<b>Total:</b>	<b>29,183</b>	<b>8,888</b>	<b>100%</b>	

## Discounted Cash Flow

							Traditional Equity Analysis				
	7/31/2009	7/31/2010	7/31/2011	7/31/2012	7/31/2013	7/31/2014	7/31/15E	7/31/16E	7/31/17E	7/31/18E	7/31/19E
	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
<b>Total Revenue</b>	<b>977</b>	<b>895</b>	<b>1,167</b>	<b>1,024</b>	<b>1,121</b>	<b>1,255</b>	<b>1,635</b>	<b>1,827</b>	<b>1,918</b>	<b>1,995</b>	<b>2,035</b>
yoy growth %	-15.2%	-8.4%	30.4%	-12.2%	9.4%	11.9%	30.3%	11.8%	5.0%	4.0%	2.0%
<b>EBITDA</b>	<b>213</b>	<b>180</b>	<b>212</b>	<b>187</b>	<b>230</b>	<b>258</b>	<b>340</b>	<b>380</b>	<b>399</b>	<b>415</b>	<b>423</b>
Margin %	21.8%	20.1%	18.2%	18.2%	20.5%	20.6%	20.8%	20.8%	20.8%	20.8%	20.8%
<b>Free Cash Flow</b>	<b>28</b>	<b>(33)</b>	<b>166</b>	<b>29</b>	<b>99</b>	<b>83</b>	<b>172</b>	<b>201</b>	<b>205</b>	<b>193</b>	<b>197</b>
<b>Present Value of Free Cash Flow (5 years)</b>							<b>160</b>	<b>173</b>	<b>164</b>	<b>143</b>	<b>136</b>

## Output Analysis

Perpetuity Growth Method - Value per Share	
Free Cash Flow at Year 5	197
WACC	7.7%
Perpetuity Growth Rate	3.5%
Perpetuity Value at End of Year 5	4,846
Present Value of Perpetuity (@ 7.7% WACC)	3,344
(+) Present Value of Free Cash Flows (@ 7.7% WACC)	776
<b>(=) Current Enterprise Value</b>	<b>4,121</b>
Short Term Debt	1
(+) Long Term Debt	626
(-) Cash and Marketable Securities	44
(-) Current Net Debt	582
(-) Current Preferred and Minority Interest	14
<b>(=) Equity Value</b>	<b>3,525</b>
Shares outstanding	36
<b>Estimated Value per Share (USD)</b>	<b>97.05</b>
Current Price (USD)	85.70

EBITDA Multiple Method - Value per Share	
Terminal EBITDA at Year 5	423
WACC	7.7%
Exit Enterprise Value / EBITDA	12.5x
Terminal Value at End of Year 5	5,291
Present Value of Terminal Value (@ 7.7% WACC)	3,651
(+) Present Value of Free Cash Flows (@ 7.7% WACC)	776
<b>(=) Current Enterprise Value</b>	<b>4,427</b>
Short Term Debt	1
(+) Long Term Debt	626
(-) Cash and Marketable Securities	44
(-) Current Net Debt	582
(-) Current Preferred and Minority Interest	14
<b>(=) Equity Value</b>	<b>3,831</b>
Shares outstanding	36
<b>Estimated Value per Share (USD)</b>	<b>105.50</b>
Current Price (USD)	85.70

Perpetuity Growth Method	
Current Price (USD)	85.70
Consensus Price Target	102.50
DCF Estimated Value per Share (US)	<b>97.05</b>
DCF Estimated Upside/(Downside)	<b>13%</b>

		Perpetuity Growth				
		2.5%	3.0%	3.5%	4.0%	4.5%
Discount Rate (WACC)	6.7%	100.52	113.96	131.60	155.78	190.95
	7.2%	88.38	98.76	111.96	129.27	153.00
	7.7%	78.62	86.86	<b>97.05</b>	110.00	127.00
	8.2%	70.62	77.29	85.37	95.38	108.09
	8.7%	63.95	69.44	75.98	83.92	93.74
		17%	33%	54%	82%	123%
		3%	15%	31%	51%	79%
		(8%)	1%	<b>13%</b>	28%	48%
		(18%)	(10%)	(0%)	11%	26%
		(25%)	(19%)	(11%)	(2%)	9%

EBITDA Multiple Method	
Current Price (USD)	85.70
Consensus Price Target	102.50
DCF Estimated Value per Share (US)	<b>105.50</b>
DCF Estimated Upside/(Downside)	<b>23%</b>

		Terminal EBITDA Multiple				
		10.5x	11.5x	12.5x	13.5x	14.5x
Discount Rate (WACC)	6.7%	93.44	101.87	110.30	118.73	127.15
	7.2%	91.40	99.63	107.87	116.10	124.33
	7.7%	89.41	97.46	<b>105.50</b>	113.54	121.59
	8.2%	87.48	95.34	103.20	111.06	118.92
	8.7%	85.60	93.28	100.96	108.64	116.32
		11.4x	12.9x	14.4x	15.9x	17.4x
		9%	19%	29%	39%	48%
		7%	16%	26%	35%	45%
		4%	14%	<b>23%</b>	32%	42%
		2%	11%	20%	30%	39%
		(0%)	9%	18%	27%	36%

## Discounted Cash Flow

							Climate Exposure Analysis				
	7/31/2009	7/31/2010	7/31/2011	7/31/2012	7/31/2013	7/31/2014	7/31/15E	7/31/16E	7/31/17E	7/31/18E	7/31/19E
	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
<b>Total Revenue</b>	977	895	1,167	1,024	1,121	1,255	1,559	1,595	1,659	1,655	1,685
<i>yoy growth %</i>	-15.2%	-8.4%	30.4%	-12.2%	9.4%	11.9%	24.2%	2.3%	4.0%	-0.3%	1.8%
<b>EBITDA</b>	213	180	212	187	230	258	304	332	353	323	367
<i>Margin %</i>	21.8%	20.1%	18.2%	18.2%	20.5%	20.6%	19.5%	20.8%	21.3%	19.5%	21.3%
<b>Free Cash Flow</b>	28	(33)	166	29	99	83	136	136	163	134	179
<b>Present Value of Free Cash Flow (5 years)</b>							127	117	131	100	124

## Output Analysis

Perpetuity Growth Method - Value per Share	
Free Cash Flow at Year 5	179
WACC	7.7%
Perpetuity Growth Rate	3.5%
Perpetuity Value at End of Year 5	4,411
Present Value of Perpetuity (@ 7.7% WACC)	3,044
(+) Present Value of Free Cash Flows (@ 7.7% WACC)	597
<b>(=) Current Enterprise Value</b>	<b>3,641</b>
Short Term Debt	1
(+) Long Term Debt	626
(-) Cash and Marketable Securities	44
(-) Current Net Debt	582
(-) Current Preferred and Minority Interest	14
<b>(=) Equity Value</b>	<b>3,045</b>
Shares outstanding	36
<b>Estimated Value per Share (USD)</b>	<b>83.85</b>
Current Price (USD)	85.70

EBITDA Multiple Method - Value per Share	
Terminal EBITDA at Year 5	367
WACC	7.7%
Exit Enterprise Value / EBITDA	12.5x
Terminal Value at End of Year 5	4,587
Present Value of Terminal Value (@ 7.7% WACC)	3,166
(+) Present Value of Free Cash Flows (@ 7.7% WACC)	597
<b>(=) Current Enterprise Value</b>	<b>3,763</b>
Short Term Debt	1
(+) Long Term Debt	626
(-) Cash and Marketable Securities	44
(-) Current Net Debt	582
(-) Current Preferred and Minority Interest	14
<b>(=) Equity Value</b>	<b>3,167</b>
Shares outstanding	36
<b>Estimated Value per Share (USD)</b>	<b>87.20</b>
Current Price (USD)	85.70

Perpetuity Growth Method	
Current Price (USD)	85.70
Consensus Price Target	102.50
DCF Estimated Value per Share (US)	<b>83.85</b>
DCF Estimated Upside/(Downside)	<b>-2%</b>

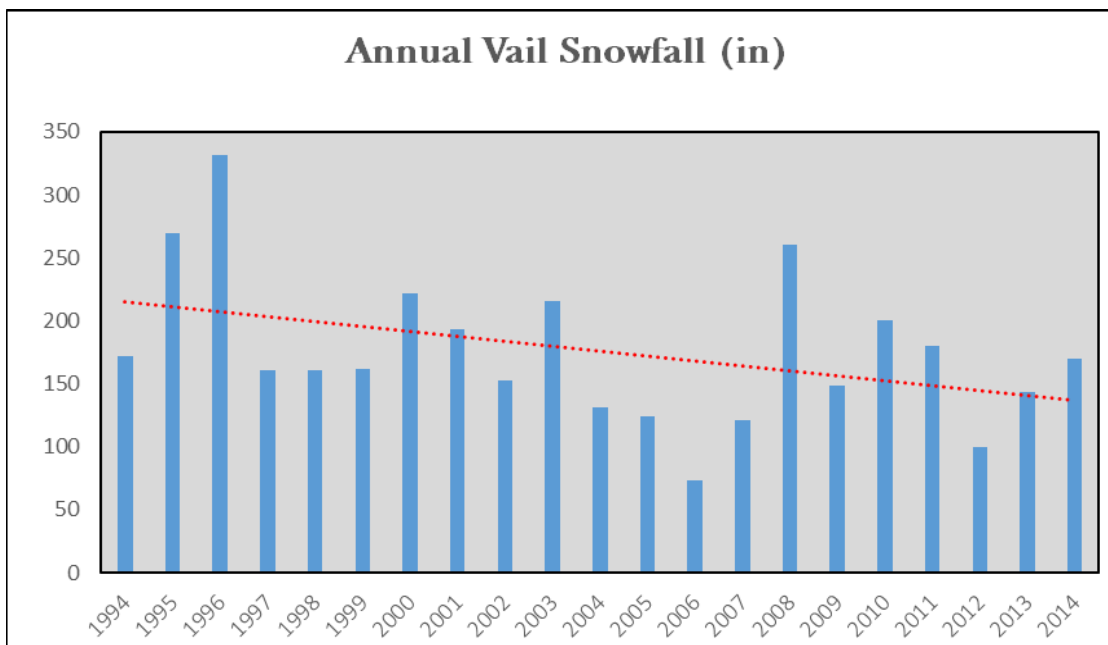
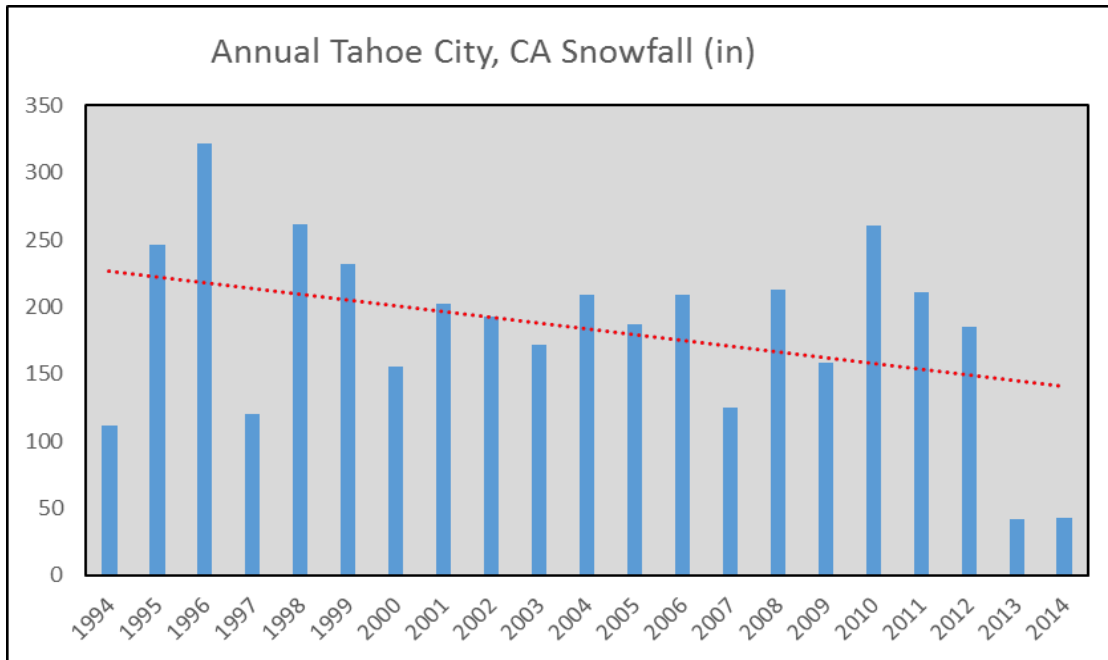
		Perpetuity Growth				
		2.5%	3.0%	3.5%	4.0%	4.5%
Discount Rate (WACC)	6.7%	87.00	99.24	115.30	137.30	169.31
	7.2%	75.96	85.41	97.42	113.18	134.77
	7.7%	67.08	74.57	<b>83.85</b>	95.64	111.11
	8.2%	59.80	65.86	73.22	82.33	93.90
	8.7%	53.72	58.72	64.67	71.90	80.84
		2%	16%	35%	60%	98%
		(11%)	(0%)	14%	32%	57%
		(22%)	(13%)	<b>(2%)</b>	12%	30%
		(30%)	(23%)	(15%)	(4%)	10%
		(37%)	(31%)	(25%)	(16%)	(6%)

EBITDA Multiple Method	
Current Price (USD)	85.70
Consensus Price Target	102.50
DCF Estimated Value per Share (US)	<b>87.20</b>
DCF Estimated Upside/(Downside)	<b>2%</b>

		Terminal EBITDA Multiple				
		10.5x	11.5x	12.5x	13.5x	14.5x
Discount Rate (WACC)	6.7%	76.75	84.05	91.36	98.67	105.97
	7.2%	74.97	82.11	89.25	96.39	103.52
	7.7%	73.25	80.22	<b>87.20</b>	94.17	101.14
	8.2%	71.57	78.39	85.20	92.02	98.83
	8.7%	69.94	76.60	83.26	89.92	96.58
		11.4x	12.9x	14.4x	15.9x	17.4x
		(10%)	(2%)	7%	15%	24%
		(13%)	(4%)	4%	12%	21%
		(15%)	(6%)	<b>2%</b>	10%	18%
		(16%)	(9%)	(1%)	7%	15%
		(18%)	(11%)	(3%)	5%	13%

**Attachment 3**



**Attachment 4**

