

FLEXIBLE BUDGETING *meets* SUSTAINABILITY *at Bacardi Limited*

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Bacardi Limited excels at innovation. One of its latest creations is an innovative application of flexible budgeting to physical measures of sustainability performance to get a more accurate picture of that performance. This picture is important because the company is seeking to become as environmentally friendly as possible and is leading and participating in a number of initiatives to do so.

One of the world's largest spirits companies, the family-owned and privately held enterprise is headquartered in Hamilton, Bermuda (its Americas headquarters is in Coral Gables, Fla.); employs nearly 6,000 people; and operates 27 production facilities in 16 countries on four continents. It's also an active member of the Beverage Industry Environmental Roundtable (BIER), a consortium of leading global beverage companies and suppliers focused on resource protection, energy efficiency, and climate change mitigation.

In 2009, Bacardi Limited became the only major spirits company to attain certification with all of its production facilities globally achieving ISO 9001, ISO 14001, and OHSAS 18001 certifications. The company began setting

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aggressive operating goals for quality, environmental impact, and health and safety under a global platform launched in September 2009. The underlying platform aims to connect and align all employees across the globe behind one set of values, strategies, and common ways of working. The Bacardi values are trust, passion, caring, and excellence. This ongoing foundation makes environmental, health, and safety objectives integral to the operations of every site through the use of key performance indicators (KPIs). The company has published Corporate Responsibility Reports since fiscal year 2008, and in 2011 its report followed the Global Reporting Initiative G3 framework at a self-declared application level B.

Bacardi pays special attention to nonfinancial performance measures, which are growing in importance. For example, the IMA® Statement on Management Account-

ing (SMA) titled "The Evolution of Accountability—Sustainability Reporting for Accountants" raises this issue: "One of the greatest challenges the management accountant will face is creating metrics that provide insight into an organization's performance in the nonfinancial areas of the triple bottom line." Yet companies need new decision-making tools to analyze their sustainability performance and resulting impacts. Bacardi Limited leadership asked Stephen Harvey, its global director of environment, health and safety, to develop a single efficiency measure for each sustainability KPI. In 2009, Harvey successfully developed and began applying an innovative measurement methodology to three environmental aspects: water consumption, energy consumption, and greenhouse gas emissions. The methodology advances the company's sustainability efforts through an application of the principles of activity-based flexible budgeting to produce indices of improvement (efficiency metrics) for sustainability KPIs based on physical quantities rather than monetary amounts. The new metrics have transformed the way Bacardi measures progress in meeting its key sustainability objectives, and they represent an innovative best practice for management control and for external reporting. The methodology can be readily understood by management, and it provides an avenue for management accountants to participate in the analysis and reporting of physical sustainability measurements. Consistent with many companies that begin the sustainability measurement journey, management accountants haven't been significantly involved in the Bacardi measurement process. But considering that the process is built on flexible budgeting principles, management accountants have an opportunity to significantly contribute to sustainability efforts by discussing the activity-based flexible budgeting approach outlined in this article with those charged with enhancing the organization's sustainability efforts.

The new methodology is a response to concerns that aggregate measures, such as total annual units of greenhouse gases emitted, don't capture the actual rates of improvement. For example, a shift in production mix from rum to Scotch whisky could cause total greenhouse gas emissions to increase even if emissions per unit of both Scotch whisky and rum are reduced. This can occur when there's a shift from the production of a product that emits lower levels of greenhouse gas per unit of production to a product that emits a higher level of greenhouse gas, such as the case when there's a shift from rum to Scotch whisky. The new methodology allows calcula-

Table 1: Bacardi Limited Efficiency Index Method (BEIM): Using Flexible Budgeting to Aggregate Performance for the CO₂ Sustainability KPI across Segments

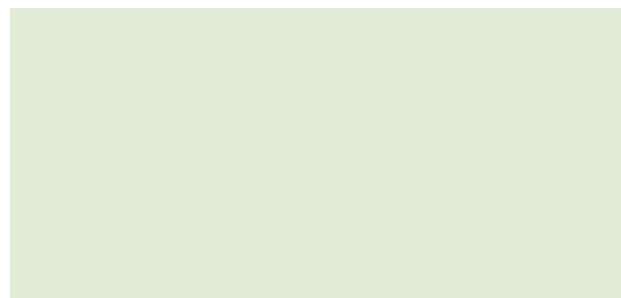
Activity	Unit	BASE YEAR			CURRENT YEAR		FLEXIBLE BUDGET	CATEGORY
		Activity	CO ₂ e	Efficiency Rate	Activity	CO ₂ e	CO ₂ e	Index
Scotch Whisky Distilleries	K-LPA	10,000	20,000	2.00	12,600	20,300	25,200	81
Tequila Distillery	K-LPA	30,000	57,600	1.92	39,900	59,700	76,608	78
Scotch Whisky Bottling	K-Cases	10,000	3,600	0.36	10,900	3,700	3,924	94
Tequila Bottling	K-Cases	10,000	4,800	0.48	13,300	5,800	6,384	91
Transportation	Mtons	4,000	34,800	8.70	4,500	38,000	39,150	97
Offices	No. of People	8,000	9,000	1.13	8,200	10,100	9,225	109
Business Travel	No. of People	8,000	7,000	0.88	8,200	8,300	7,175	116
			136,800			145,900	167,666	87

tion of efficiency metrics, or KPIs, that aren't distorted by changes in the production mix. In addition, these metrics can be aggregated across product lines to provide company-wide measures of efficiency improvement (aggregate performance indices, or APIs) that aren't distorted by shifts in production mix. Bacardi Limited uses the efficiency metrics internally for decision support, planning, and control. The resulting APIs for each sustainability KPI (greenhouse gas emissions, energy consumption, and water consumption) are highlighted along with absolute measures of sustainability performance in the company's Corporate Responsibility Reports.

Let's take a look at the activity-based flexible budgeting methodology Bacardi Limited developed for measuring performance improvements in sustainability KPIs.

Bacardi Efficiency Index Method (BEIM): A Flexible Budget Application

The example that follows is a hypothetical illustration of the innovative application of flexible budgeting to sustainability performance measures by Bacardi Limited. The company begins by measuring the relationship between the amount of a sustainability KPI relative to the activity level in a base year. For example, say Bacardi measures CO₂ emissions at a Scotch whisky distillery in the base year, 2010, and finds that it produced 10,000 liters of pure alcohol (K-LPA) while emitting 20,000 units of CO₂. Thus, for 2010, the rate of emissions would be two units of CO₂ for each thousand liters of pure alcohol. At the end of 2011, the company combines the actual level of activity—let's say 12,600 K-LPA—with the rate



from the base year. The resulting flexible budget for 2011 is 25,200 units of CO₂ (2 units × 12,600 liters). This means that if there is no change in efficiency, 25,200 units of CO₂ are expected to be emitted at the higher level of activity.

The company then compares the actual amount of CO₂ emitted during 2011—let's say 20,300 units—to the flexible budget amount of 25,200 units. As management accountants, we usually look at this difference of 4,900 CO₂ units (25,200 – 20,300) and identify the amount as a favorable flexible budget variance. Instead, Bacardi Limited extends the analysis by converting the variance to an index number. The resulting index for 2011 is 81 (100 × 20,300 units / 25,200 units). The interpretation is that there has been a 19% (100 – 81) improvement in the efficiency of CO₂ emissions at the distillery. The environment, health and safety group within the company is charged with the responsibility for collecting the data from each operating segment (such as distilleries and offices) and making the calculations.

Table 1 provides a hypothetical example for seven operating segments. A challenge that Bacardi Limited faces is how to provide a meaningful aggregation of sus-

Table 2: BEIM: Flexible Budget with Growth in Activity
Where the Fixed Component Is Factored Out

Activity	Unit	BASE YEAR			CURRENT YEAR		FLEXIBLE BUDGET	CATEGORY
		Activity	CO ₂ e	Efficiency Rate	Activity	CO ₂ e	CO ₂ e	Index
Scotch Whisky Distilleries - Fixed component	K-LPA	10,000	1,400				1,400	
Scotch Whisky Distilleries - Variable component	K-LPA	10,000	18,600	1.86	12,600		23,436	
Scotch Whisky Distilleries - Total	K-LPA	10,000	20,000	2.00	12,600	20,300	24,836	82
Tequila Distillery - Fixed component	K-LPA	30,000	4,032				4,032	
Tequila Distillery - Variable component	K-LPA	30,000	53,568	1.79	39,900		71,245	
Tequila Distillery - Total	K-LPA	30,000	57,600	1.92	39,900	59,700	75,277	79
Scotch Whisky Bottling - Fixed component	K-Cases	10,000	360				360	
Scotch Whisky Bottling - Variable component	K-Cases	10,000	3,240	0.32	10,900		3,532	
Scotch Whisky Bottling - Total	K-Cases	10,000	3,600	0.36	10,900	3,700	3,892	95
Tequila Bottling - Fixed component	K-Cases	10,000	480				480	
Tequila Bottling - Variable component	K-Cases	10,000	4,320	0.43	13,300		5,746	
Tequila Bottling - Total	K-Cases	10,000	4,800	0.48	13,300	5,800	6,226	93
Transportation - Fixed component	Mtons	4,000	1,740				1,740	
Transportation - Variable component	Mtons	4,000	33,060	8.27	4,500		37,193	
Transportation - Total	Mtons	4,000	34,800	8.70	4,500	38,000	38,933	98
Offices - Fixed component	No. of People	8,000	450				450	
Offices - Variable component	No. of People	8,000	8,550	1.07	8,200		8,764	
Offices - Total	No. of People	8,000	9,000	1.13	8,200	10,100	9,214	110
Business Travel - Fixed component	No. of People	8,000	350				350	
Business Travel - Variable component	No. of People	8,000	6,650	0.83	8,200		6,816	
Business Travel - Total	No. of People	8,000	7,000	0.88	8,200	8,300	7,166	116
			136,800			145,900	165,543	88.1

Table 3: BEIM: Flexible Budget with Decline in Activity
Where the Fixed Component Is NOT Factored Out

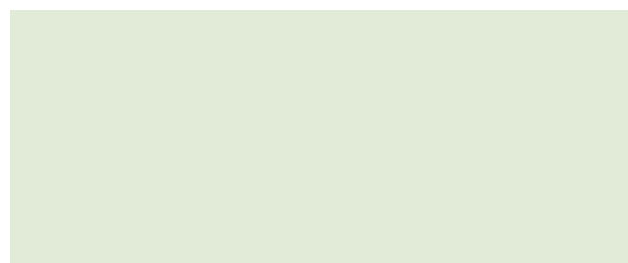
Activity	Unit	BASE YEAR			CURRENT YEAR		FLEXIBLE BUDGET	CATEGORY
		Activity	CO ₂ e	Efficiency Rate	Activity	CO ₂ e	CO ₂ e	Index
Scotch Whisky Distilleries	K-LPA	10,000	20,000	2.00	9,000	14,500	18,000	81
Tequila Distillery	K-LPA	30,000	57,600	1.92	25,000	38,208	48,000	80
Scotch Whisky Bottling	K-Cases	10,000	3,600	0.36	8,900	3,015	3,204	94
Tequila Bottling	K-Cases	10,000	4,800	0.48	8,512	3,712	4,086	91
Transportation	Mtons	4,000	34,800	8.70	3,700	31,160	32,190	97
Offices	No. of People	8,000	9,000	1.13	7,800	9,595	8,775	109
Business Travel	No. of People	8,000	7,000	0.88	7,800	7,885	6,825	116
			136,800			108,075	121,080	89.3

tainability KPIs across business segments with differing activity measures—say thousands of liters of pure alcohol vs. number of people employed within the operating segment. The company resolves this by continuing with the flexible budgeting approach. For example, it sums the amounts of CO₂ emissions projected by the flexible bud-

get for 2011 to a total of 167,666 units to obtain the total emissions expected for all segments combined, assuming no efficiency improvement relative to the base year. The actual amount of total emissions across all segments for 2011 is calculated as 145,900 units. An overall index weighted by activity level is calculated by taking the ratio

**Table 4: BEIM: Flexible Budget with Decline in Activity
Where the Fixed Component Is Factored Out**

Activity	Unit	BASE YEAR			CURRENT YEAR		FLEXIBLE BUDGET	CATEGORY
		Activity	CO ₂ e	Efficiency Rate	Activity	CO ₂ e	CO ₂ e	Index
Scotch Whisky Distilleries - Fixed component	K-LPA	10,000	1,400				1,400	
Scotch Whisky Distilleries - Variable component	K-LPA	10,000	18,600	1.86	9,000		16,740	
Scotch Whisky Distilleries - Total	K-LPA	10,000	20,000	2.00	9,000	14,500	18,140	80
Tequila Distillery - Fixed component	K-LPA	30,000	4,032				4,032	
Tequila Distillery - Variable component	K-LPA	30,000	53,568	1.79	25,000		44,640	
Tequila Distillery - Total	K-LPA	30,000	57,600	1.92	25,000	38,208	48,672	79
Scotch Whisky Bottling - Fixed component	K-Cases	10,000	360				360	
Scotch Whisky Bottling - Variable component	K-Cases	10,000	3,240	0.32	8,900		2,884	
Scotch Whisky Bottling - Total	K-Cases	10,000	3,600	0.36	8,900	3,015	3,244	93
Tequila Bottling - Fixed component	K-Cases	10,000	480				480	
Tequila Bottling - Variable component	K-Cases	10,000	4,320	0.43	8,512		3,677	
Tequila Bottling - Total	K-Cases	10,000	4,800	0.48	8,512	3,712	4,157	89
Transportation - Fixed component	Mtons	4,000	1,740				1,740	
Transportation - Variable component	Mtons	4,000	33,060	8.27	3,700		30,581	
Transportation - Total	Mtons	4,000	34,800	8.70	3,700	31,160	32,321	96
Offices - Fixed component	No. of People	8,000	450				450	
Offices - Variable component	No. of People	8,000	8,550	1.07	7,800		8,336	
Offices - Total	No. of People	8,000	9,000	1.13	7,800	9,595	8,786	109
Business Travel - Fixed component	No. of People	8,000	350				350	
Business Travel - Variable component	No. of People	8,000	6,650	0.83	7,800		6,484	
Business Travel - Total	No. of People	8,000	7,000	0.88	7,800	7,885	6,834	115
			136,800			108,075	122,153	88.5



of 145,900 units to 167,666 units and multiplying by 100, yielding an index of 87 (see Table 1). The interpretation is that, aggregating over all segments, there has been a 13% improvement in the efficiency of CO₂ emissions even though total (absolute) CO₂ emissions have increased from 136,800 to 145,900 units.

The preceding example describes the current Bacardi Limited process for measuring efficiency improvements for sustainability key performance indicators. A notable feature is that the approach treats the sustainability KPIs as entirely variable. That's because the original derivation of the method the company used was based on the cost accounting method for financial reporting purposes in which fixed manufacturing costs are absorbed into unit product cost. But the effect is to incorrectly treat fixed

sustainability KPI contributions as variable. The flexible budgeting method (the current method Bacardi Limited uses) can be readily adapted to include both fixed and variable components of the total emissions to yield a more accurate measure of efficiency change.

A New Approach

Bacardi Limited also has started a pilot study at the plant level to measure the fixed and variable components of its KPIs. The following examples illustrate the importance of measuring the fixed and variable relationships between activity levels and the relevant KPI.

The numbers in Table 1 illustrate an overall increase in activities relative to the base year. Table 2 uses the identical activity variations but considers that there's a fixed component in the sustainability KPI levels (7% for distilling, 10% for bottling, and 5% for transportation, offices, and business travel in the base year). As a result, a new efficiency rate is calculated for the variable component, and we find that the efficiency rate for the Scotch whisky distilleries variable component drops from 2 to 1.86. The fixed level of CO₂ emissions is estimated at 1,400 and is expected to remain unchanged over the budgeting period.

In the final analysis, we see that the more accurate measure of the overall efficiency improvement drops from 13% to 11.9%. When growth occurs and the behavior of the sustainability KPI is incorrectly assumed to be entirely variable, the metric will overestimate efficiency improvements.

Table 3 illustrates a decline in the activity levels for the current year. Assume that total (absolute) CO₂ emissions decline from 136,800 to 108,075 units. Presuming that the sustainability KPI is entirely variable, the efficiency improvement appears to be 10.7% (100% – 89.3%). Using the same activity variation but factoring out the fixed portion, which is identical to the approach used in Table 2, Table 4 shows the more accurate measure of efficiency improvement of 11.5% (100% – 88.5%). The consequence of treating the behavior of the sustainability KPI as entirely variable results in a more conservative estimate (i.e., underestimating efficiency improvements).

More Accurate Evaluations

The Bacardi Efficiency Index Method is a decision support tool that helps the managers evaluate sustainability performance more accurately, and it provides more meaningful aggregate performance measures for external reporting. Bacardi Limited has used this innovative methodology to establish sustainability performance targets and to report sustainability performance improvements in its Corporate Responsibility Reports since 2008. (Visit www.bacardilimited.com/corporate-responsibility/corporate-responsibility-policy for more information.)

As we showed here, Bacardi Limited has developed a useful measurement tool for sustainability improvement that other companies can use. To recap, we examined several scenarios that included a treatment where the behavior of a sustainability KPI is entirely variable vs. the recognition of both the variable component and the fixed component. We also included the scenarios of increasing and decreasing activity level. In the implementation process, Bacardi Limited has reached the point of beginning to factor out the fixed component of the sustainability KPIs at the plant level. Separation of the KPIs into both fixed and variable components allows the company to better plan, manage, and control sustainability efforts.

Future and Emerging Applications

As integrated reporting develops, there will be more need for companies like Bacardi to plan, manage, and control such sustainability performance indexes and impacts and include this information in their integrated reports. Inte-

grated reporting is being promoted by the International Integrated Reporting Council (IIRC), which defines it as “the language for sustainable business and the means by which companies communicate how value is created and will be preserved over the short, medium, and long term.” Through its pilot program, the IIRC is attempting “a new approach to corporate reporting that demonstrates the linkages between an organization’s strategy, governance, and financial performance and the social, environmental, and economic context within which it operates.” (See www.theiirc.org for more on this subject.) Linkages like those Bacardi is exploring can become the cornerstones of improvement on nonfinancial measures included in integrated reports. **SF**

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