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The Electric Power Industry Business Case for Sustainability

Literature Review and Executive Rationale

2015 TECHNICAL REPORT

The Electric Power Industry Business Case for Sustainability

Literature Review and Executive Rationale

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Abstract

Electric power companies face varying degrees of external and internal demand for sustainability action. EPRI's Electric Sustainability Interest Group (ESIG) has considered the most compelling business case for sustainability for the electric power industry. This report systematically considers this question through 1) a literature review on the business case for corporate sustainability with specific call-outs related to the electric power industry, and 2) a summary to inform executive decision making regarding sustainability.

Research revealed numerous academic studies finding correlations between sustainability and cost of capital, market performance, and accounting performance. The business case for sustainability from the research can be summarized into three general opportunities: saving money, making money, and managing risk.

This report is intended to answer the following broad questions within the electric power sector:

- Is corporate sustainability linked to financial performance?
- What is the return on investment (ROI) for specific sustainability actions?
- What is the most compelling evidence for executive decision makers that sustainability is valuable?

Keywords
Sustainability
Corporate social responsibility (CSR)
Environmental stewardship
Financial performance
Business case
Return on investment (ROI)

Executive Summary

Electric power companies face unique challenges and tradeoffs regarding sustainability. While adhering to their core mandate of providing safe, reliable, and affordable electric power, they must at the same time undertake the challenge of evolving their operations to include innovative technologies and address emerging national security issues. Current consideration of the future power system, reduction of coal generation, increasing distributed generation, and the fully "Integrated Grid" where energy consumers are now also power generators, makes the analysis of "sustainable" even more timely. As the industry undergoes this historic transformation, it must consider its sustainability position across economic, environmental, and social performance.

EPRI's Electric Sustainability Interest Group (ESIG) has considered the most compelling business case for sustainability for the electric power industry. This report systematically considers this question through: 1) a literature review on the business case for corporate sustainability with specific call-outs related to the electric power industry, and 2) a summary to inform executive decision-making regarding sustainability.

From a review of 18 academic studies, we found evidence of correlations between sustainability and cost of capital, market performance, and accounting performance. The most notable finding of the literature review was the relatively new body of research investigating the link between sustainability performance and cost of capital. While many of the studies analyzed in this literature review found positive correlations, not all academic studies agree on a clear relationship. Active research and academic debate are ongoing. New developments will be important to understand the link between sustainability and cost of capital.

The report also focuses on communicating the value of sustainability to an electric power company executive. This drew on research from the literature review, but also added real-world examples tailored to the perspective of an electric power company. We organized the business case for sustainability into three general opportunities: saving money, making money, and managing risk. Saving money

may be found from reduced costs of capital, employee retention and engagement, and tax savings, among other savings. Opportunities for making money can be found through increased market returns, and innovation in products, processes or business models. Managing risk through strong sustainability programs has been realized in reduction of both reputational and regulatory risk.

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Section 1: Introduction

Electric power companies face unique challenges and tradeoffs regarding sustainability. While adhering to their core mandate of providing safe, reliable, and affordable electric power, they must at the same time undertake the challenge of evolving their operations to include innovative technologies and addressing emerging national security issues. Current consideration of the future power system, reduction of coal generation, increasing distributed generation, and the fully "Integrated Grid" where energy consumers are now also power generators, makes the analysis of "sustainable" even more timely.[1] As the industry undergoes this historic transformation, it must consider its sustainability position across economic, environmental, and social performance.

For the purposes of this report, corporate sustainability refers generally to a business strategy that incorporates and balances economic, social, and environmental considerations.

Corporate sustainability is a dynamic concept encompassing nuanced variations such as "corporate responsibility," "corporate social responsibility (CSR)," "environmental, social, and governance" (ESG) and "stewardship." For the purposes of this report, corporate sustainability refers generally to a business strategy that incorporates and balances economic, social, and environmental considerations. The challenge for electric power companies to simultaneously address the myriad of issues is indeed formidable. Figure 1-1 illustrates the three pillars of sustainability in the context of the electric power industry's core mandate.

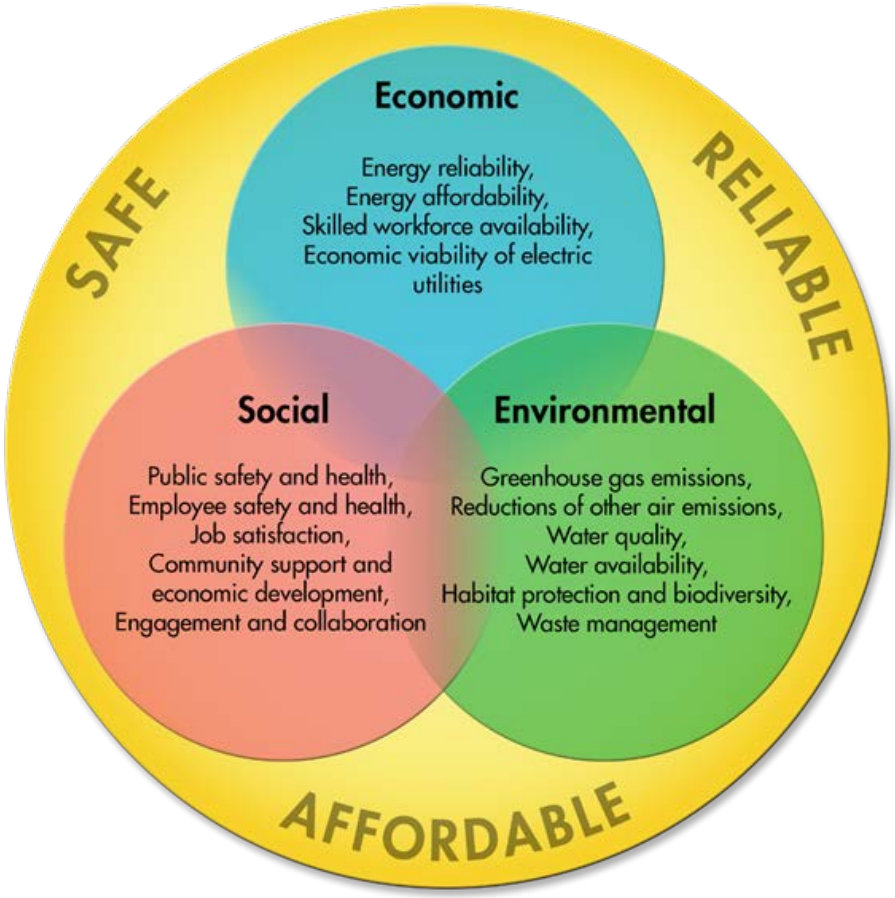

Figure 1-1
The industry's core mandate and the three pillars of sustainability

Background

EPRI's Energy Sustainability Interest Group (ESIG) was formed in 2008 to provide a collaborative forum for EPRI members to discuss and address issues related to sustainability. Electric power companies face varying degrees of external and internal demand for sustainability action. For example, a Public Utilities Commission has convened electric utilities to discuss their work related to sustainability.[2] Other investor-owned electric power companies may be driven by investor demand for sustainability action. The socially-responsible investment (SRI) arena totaled $3.74 trillion across all industries in 2010, up 20% over 2009.[3] Multiple investment vehicles target companies based on sustainability performance. Recently, a private firm has begun looking specifically at utility companies and ranking their sustainability performance to create a best-in-class utility index.[4] In addition, shareholders may pressure companies on sustainability issues; in 2014, 10 electric power companies were faced with shareholder resolutions on environmental, social, and governance issues, and 417 shareholder resolutions were filed across all industries on these same issues.[5]

While facing these external drivers for sustainability, electric power companies also face differing situations regarding internal support for sustainability. In a survey of electric utility respondents, 71% (134 responses) noted that sustainability was "part of our core values."[6] Figure 1-2 indicates the priority of sustainability issues within electric utility leadership – from being not a priority to being a top priority of the CEO.

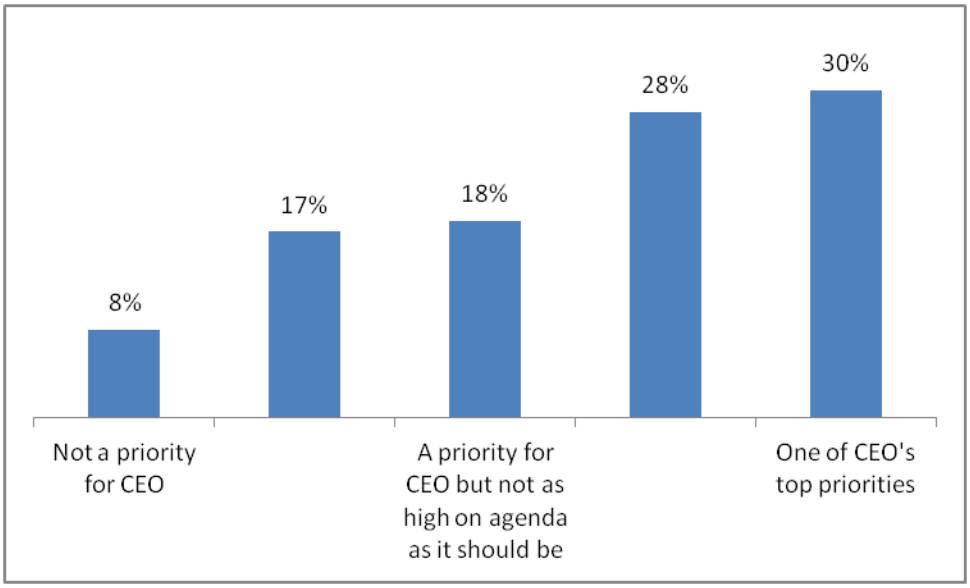

Figure 1-2
Answers of utility respondents (134 responses) to the question "Where is sustainability on your CEO's agenda?"[7]

Objectives and Approach

One of the key objectives in ESIG's research is to investigate the business case for sustainability. This report is intended to answer the following broad questions within the electric power sector:

- Is corporate sustainability linked to financial performance?
- What is the return on investment (ROI) for specific sustainability actions?
- What is the most compelling evidence for executive decision makers that sustainability is valuable?

The research methodology focused on a review of the academic literature, grey literature (academic literature that is not formally published), articles, reports, and real life case studies related to the business case for sustainability. This report provides: 1) a literature review on the business case for corporate sustainability with specific call-outs related to the electric power industry, and 2) a summary to inform executive decision-making regarding sustainability.

Academic research and business understanding of the link between sustainability performance and financial performance is continuing to evolve; consolidation and refinement will likely be needed going forward.

Section 2: Literature Review

This section presents a summary of the literature relating to the business case for sustainability to inform the first two research questions:

- Is corporate sustainability linked to financial performance?
- What is the return on investment (ROI) for specific sustainability actions?

There is a growing body of academic literature investigating the link between sustainability and financial performance. There are two general theories regarding corporate investments in sustainability in the literature. The first theory is that investments in sustainability incur costs, whereas benefits (such as reputation) accrue to managers rather than the firm's shareholders (Friedman, 1970[8]; Margolis and Walsh, 2003[9]). From this view, corporate spending on sustainability is an unnecessary extravagance, akin to spending on a corporate jet. The second "stakeholder agency" theory is that investments in sustainability enhance profitability through various means: competitive advantage, reputation, retaining higher quality employees, creating unforeseen innovations, creating "moral capital," and other manifestations of risk reduction (Bassen et al., 2006,[10] Cheng et al., 2011[11]). Overall, the studies in this literature review attempt to support or discount these two general theories.

Approach and Definitions

Eighteen academic studies on the relationship between sustainability and financial performance were reviewed.

Literature on the relationship between sustainability and financial performance dates back to the early 1970s. Eighteen academic studies were collected, all but three from the last decade. Included in this set was a meta-analysis conducted by Deutsche Bank (DB),[12] original sources from that report, several other studies from a search of the ScienceDirect database of peer-reviewed journal articles, and additional frequently-cited meta-analyses. The individual research papers (14) are summarized first, and meta-analyses (4) second. Table 2-1 provides definitions of select terms used in the literature we reviewed.

Table 2-1
Definitions of terms used in the literature

Definitions
Accounting-based performance: Performance based on return on assets, return on equity, or firm value.[13]
Cost of capital: Refers to the cost of funding a business. If the business is financed through debt, the cost of debt is the interest rate. If the business is financed through equity (stock), cost of equity reflects that a firm will need to increase earnings to compensate for risk.[14] [15]
Environmental, Social, and Governance (ESG): "A set of standards for a company's operations that socially conscious investors use to screen investments. Environmental criteria look at how a company performs as a steward of the natural environment. Social criteria examine how a company manages relationships with its employees, suppliers, customers and the communities where it operates. Governance deals with a company's leadership, executive pay, audits and internal controls, and shareholder rights."[16] Has been described as a best-in-class approach (e.g., rating companies based on performance on metrics).[17]
Market-based performance: Performance based on stock or bond price, fund returns, or Tobin's Q.
KLD database:[18] Many of the academic studies cite the use of this private database of ESG information. The database is described by Goss and Roberts (2011) as "widely accepted by practitioners and academics as an objective measure of corporate social responsibility" (p.1796).[19] The thirteen dimensions of ESG collected in the database are: community, corporate governance, diversity, employee relations, environment, human rights, product characteristics, alcohol, gambling, firearms, military, tobacco and nuclear power.[20] The data is characterized as a strength or concern and each dimension is given a score. A sample of the 44 individual "strengths" indicators in the KLD database includes: pollution prevention, limited executive compensation, support for education, diversity in the board of directors, and strong health and safety programs. The 37 individual "concerns" indicators include the lack of the above-noted, and other indicators such as: poor relations with indigenous peoples, hazardous waste liabilities, and fines or civil suits related to product safety.[21] Many of the studies below develop an aggregated score by subtracting concerns from strengths. The database covers S&P 500 and Russell 2000 (small-cap) U.S. firms. KLD was bought by MSCI in 2010.[22]
Return on assets (ROA): "An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets."[23]
Return on equity (ROE): "The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested."[24]
Socially-responsible investment (SRI): "A process within the context of financial analysis, which takes into account social, environmental and ethical consequences when selecting, retaining, or realizing investments."[25] Has been described as a screening-out approach (e.g., screening out tobacco, firearms, or nuclear power companies).[26]
Spread: In the case of bonds, spread is the difference between a bond's offering yield and the yield of a treasury bond.[27] In the case of bank loans, it is the difference between an average interest rate (e.g., prime) and the rate charged for a particular loan. Spread indicates risk: the riskier the borrower, the greater the spread between the borrower's yield/interest rate and the treasury bond yield/average interest rate.

The proxies for sustainability were primarily ESG indicators from the KLD or Thompson Reuters ASSET4 databases.

Of the 14 individual research papers reviewed, one focused on SRI fund performance (Weber, 2010).[28] For the remaining 13 papers, proxies for sustainability were based on ESG indicators – either in aggregate, or focusing on one pillar (environmental, social, or governance). In multiple cases, ESG indicators were analyzed by "strengths" versus "concerns," which was a categorization of the KLD ESG database. Seven of the studies used ESG data from the KLD database. Two of the globally-focused studies used ESG data from the Thomson Reuters ASSET4 database.

Other proxies for sustainability were:

- Unique sustainability ratings (Bassen et. al, 2006; Weber et al., 2010).
- Having published a stand-alone CSR report between 1993-2007 (Dhaliwal et al., 2011[29]).
- Being included on the "100 Best Companies to Work for in America" list (Edmans, 2011[30]).
- Aggregate pounds of toxic chemicals emitted from the EPA-mandated reporting on the Toxic Release Inventory (TRI) normalized by dollar value of the firm (Konar and Cohen, 2001[31]).
- Having an environmental lawsuit pending in 1989 (Konar and Cohen, 2001).
- Inclusion in a portfolio of SRI funds (Weber et al., 2010).

The proxies for firm performance in the research were related to market-based performance, accounting-based performance, or cost of capital.

In terms of firm performance, the studies generally look for indications of financial performance in: market-based performance, accounting-based performance, or cost of capital. Cost of capital research appears to be a more recent phenomenon, as we found no study on cost of capital conducted prior to 2004. The studies used the following proxies of firm performance:

- β (beta)[1] – a market-based risk measure (Bassen et. al, 2006).
- Bank loan spread (Chava, 2011[32]; Goss and Roberts, 2011[33]).
- Bond spread (Bauer et al., 2009[34]; Bauer and Hann, 2010; Nandy and Lodh, 2012[35]).
- Capital constraints – an inability to fund all desired investments (Cheng et al., 2011).
- Cost of equity – an indication of demand for higher return to mitigate perceived risk (Chava, 2011; Ghoul et al., 2011[36]).
- Credit rating of corporate bonds (e.g., S&P 500 or Moody's credit rating scale of AAA to D) (Bassen et. al, 2006; Bauer et al., 2009; Bauer and Hann, 2010).
- Monthly returns of SRI funds (Weber et al., 2010).

[1] "A measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole" (Investopedia, 2015).

- Return on assets (ROA) – an accounting-based measure of performance (Bassen et al, 2006; Eccles et al., 2013[37]).
- Return on equity (ROE) – an accounting-based measure of performance (Bassen et. al, 2006; Eccles et al., 2013).
- Stock market performance (Bassen et. al, 2006; Eccles et al., 2013; Edmans, 2011).
- Tobin's Q – ratio of market price of a company divided by the replacement value of company's assets, said to represent intangible assets[38] (Konar and Cohen, 2001).

The studies control for well-known factors that could affect firm performance.

The studies control for well-known factors that could affect the proxy of firm performance, such as: firm size, total assets, earnings normalized by assets, leverage (debt/assets), market share of the firm, and country (an indicator of level of regulation, required disclosure, and accounting method).

"Significant" in the context of academic literature refers to statistically significant results.

Most of the studies performed multiple analyses, including correlation analysis, regression analysis, and more complicated analyses. "Significant" in the context of academic literature refers to statistically significant results. Correlation analysis tests whether two variables significantly co-vary or are correlated. Regression analyses find whether there is a "fit," or a relationship, between a dependent variable (e.g., a proxy of firm performance) and one or more independent variables (e.g., a proxy of sustainability and control variables) in a data set. Regression analysis outcomes indicate the significance of the relationship and also the explanatory effect of the independent variable (r^2 value).[39] The r^2 value indicates how much of the variation of firm performance in a data set can be explained by the sustainability variable. Regression models produce an equation and the studies occasionally "plug in" figures to show the effect at the mean level of all the variables or to predict effects from a marginal change in a variable of interest (Bauer et al., 2009; Konar and Cohen, 2001).

The findings from the eighteen studies are summarized below. First, results from the 14 individual studies are reviewed, categorized by the proxies of firm performance: cost of capital, market-based performance, and accounting-based performance. Findings from the four meta-analyses are reviewed separately, due to the different nature of analysis. A summary of all findings from the literature review is summarized in Table 2-2.

Cost of capital affects investor owned utilities (IOUs) and non-IOUs alike: all organizations needing access to funds pay for the privilege of doing so.

Cost of Capital

Eight of the fourteen studies examined the relation of sustainability performance to cost of capital. Cost of capital affects investor owned utilities (IOUs) and non-IOUs alike: all organizations needing access to funds are evaluated by their lenders or investors. Riskier borrowers pay a premium for access to funding. These academic studies examine whether data on bank loan spread, credit rating of corporate bonds, cost of equity, or capital constraints were significantly related to sustainability proxies. Seven of the cost of capital studies used the KLD ESG database for sustainability data, and one used the ASSET4 ESG database.

Multiple studies found significant relationships between an aggregate ESG rating and bank loan spread (Chava 2011; Goss and Roberts, 2011; Nandy and Lodh, 2012) or capital constraints (Cheng et al. 2011). Goss and Roberts developed an aggregate score of ESG strengths and concerns, determined the average score, and separated the sample into below average and above average scores.

Chava (2011) and Nandy and Lodh (2012) found that firms with net environmental concerns paid greater interest rates on bank loans (higher bank spreads).

Goss and Roberts found that firms with below-average aggregate sustainability performance paid more for bank loans than high-performance firms, but the difference was a "modest economic impact" (between 0.07% and 0.18%). Chava and Nandy and Lodh looked only at environmental indicators, and also found that firms with net environmental concerns paid greater interest rates on bank loans (higher bank spreads). Environmental "strengths" (environmentally beneficial products and services; pollution prevention; recycling; clean energy; management systems; property, plant, and equipment; and other strengths)[40] were not found to be significantly related to bank loan spread (i.e., "good" firms did not have significantly lower interest rates). This finding suggests that investors and lenders weigh environmental concerns (hazardous waste, regulatory problems, ozone depleting chemicals, substantial emissions, agricultural chemicals, climate change, other concern)[41] more than strengths (Chava, 2011; Goss and Roberts, 2011). A more nuanced analysis by Goss and Roberts investigated whether banks could understand attempts of 'greenwashing,' indicated by discretionary spending on environmental strengths, which the authors described as "overinvestment in CSR." The authors analyzed a category of "low quality" borrowers that had to pledge collateral. Goss and Roberts found that low quality borrowers paid more for loans as ESG strengths increased, and the authors concluded, "Banks are able to discriminate between valuable and wasteful CSR expenditures… efforts to manipulate stakeholders with 'greenwashing' are likely to be unsuccessful" (p.1807). Goss and Roberts investigated a dichotomous indication rather than different levels of strengths, so do not provide insight on what threshold of investment in strengths is an "overinvestment."

Bassen at al. (2006) focused on 44 utility firms (most from the U.S. and U.K.) and found a significant relationship between a sustainability rating and bond ratings.

Three studies in the sample investigated links between corporate bond spreads or bond ratings and sustainability proxies. Bassen at al. (2006) focused on 44 utility firms (most from the U.S. and U.K) and found a significant relationship between a unique sustainability performance rating created within the analysis and bond ratings. Bassen et al. created the ranking based on 38 sustainability performance measures identified and developed within the study itself, weighted by financial industry perceptions of importance. The other two studies found significant relationships with strengths and concerns of both environmental and social indicators and bond performance (Bauer et al., 2009; Bauer and Hann, 2010). Bauer et al. created an "Employee Relations Index" made up of multiple social indicators and noted that a one-point increase in their index, "given… the median bond issue size is $300 million" is predicted with the model to be related to a "$60,000-$120,000 decrease in annual interest expense" (p.14). Bauer and Hann noted "the maximum impact of a combined change in our environmental performance measures on the annual cost of debt is estimated at 64 basis points [0.64%]" (p.15).

Chava (2011) found that investors demand higher returns when a stock has hazardous chemicals, "substantial emissions" or climate change concerns.

Three studies in the sample found mixed results regarding sustainability indicators and cost of equity. Ghoul et al. (2011) found a statistically significant difference between the mean cost of equity capital between an above-median and below-median score on an aggregated sustainability performance rating was 56 basis points (0.56%). When Chava (2011) reviewed only environmental indicators, they found a significant relation of implied cost of equity (described as analysts' earnings estimates) and environmental concerns, but not environmental strengths. In other words, investors demand higher returns when a stock has hazardous chemical, "substantial emissions" or climate change concerns.

Dhaliwal et al. (2011) did not find a significant relation between publishing a sustainability report and cost of equity, but more nuanced analyses did find: 1) lower cost of equity for high-performance firms that disclosed, and 2) that "firms with a high cost of equity capital in the previous year tend to initiate disclosure of CSR activities in the current year" (p.59).

Market-Based Performance

Five studies in the sample looked at the relation of a sustainability proxy to market-based performance.

Weber et al. (2010) constructed a portfolio of global SRI funds and compared monthly returns to the MSCI World Index over the long term (an eight-year period). When looking simply at the performance of the two portfolios, Weber et al. found that SRI funds outperformed significantly, both overall and also during bull and bear phases (rising and declining market phases, respectively). However, when considering the relation of SRI fund monthly returns and a uniquely-constructed sustainability rating, the authors noted a significant *negative* relation. The authors interpreted it this way: "to rely only on sustainability or social responsibility analyses did not have a positive effect on the financial return of funds… It is possible to create a well-performing SRI portfolio by adding an in-depth financial analysis to the sustainability analysis" (p.13). It is not known how the investments in the SRI portfolio that was analyzed were chosen. For example, an SRI fund may screen out investments on a single criteria, such as tobacco products and this screen may not reflect sustainability performance. The 2012 Deutsche Bank meta-analysis argued that this type of analysis of SRI funds that screens for non-sustainability issues would show less correlation to market performance than analysis of companies based on sustainability metric performance.

Eccles et al. (2013) compared a "high sustainability" portfolio of 180 companies that had adopted sustainability policies in the early 1990s versus a matched sample "low sustainability" portfolio, and found 4.7% higher annual stock market performance for the "high sustainability" portfolio.

Eccles et al. (2013) also compared a "high sustainability" portfolio versus a "low sustainability" portfolio, but instead of analyzing SRI funds, the authors chose a sample of 180 companies that had adopted sustainability policies in the early 1990s, found a matched sample of similar firms that had not, and analyzed long-term performance (1993-2010). The authors found significant out-performance: the "high sustainability" portfolio had 4.7% higher annual stock market performance over the "low sustainability" portfolio.

Edmans (2011) looked at long-term stock market performance of a portfolio indicating employee satisfaction. Edmans found that "a value-weighted portfolio of the '100 Best Companies to Work for in America' earned… 2.1% above industry benchmarks" from 1984 to 2009 (p.621).

Edmans (2011) found that "a value-weighted portfolio of the '100 Best Companies to Work for in America' earned… 2.1% above industry benchmarks" from 1984 to 2009 (p.621).

Konar and Cohen (2001) found that intangible assets were significantly and negatively related to TRI emissions levels: "a 10% reduction in emissions [pounds] of toxic chemicals results in a $34 million increase in market value" (p.281). Intangible assets were also significantly related to the number of pending environmental lawsuits. Konar and Cohen used their regression model to calculate an average of $380 million "liability" for the average pounds of TRI emissions and average number of lawsuits found in the sample.

Bassen et al. (2006), in addition to their investigation of bond ratings, investigated market-based performance and found that the logarithm return[2] (normalized return) of market-based performance was significantly related to the authors' unique rating on corporate responsibility. The authors noted, however, that the rating of corporate responsibility had a low explanatory effect. In other words, although the correlation was statistically significant, the effect of increases in the rating led to relatively low increases in logarithm returns.

With the exception of one of the analyses in Weber et al. (2010), all of the market-based studies showed significant positive relationships between a sustainability proxy and market-based performance.

Accounting-Based Performance

Only two studies in the sample examined accounting-based firm performance. Eccles et al. (2013) found that firms that had been early adopters of sustainability policies had greater ROE and ROA over the long term as compared to firms that had not. Bassen et al. (2006) found that ROA and ROE were not significantly related to a unique rating on sustainability performance, but noted that a correlation between their rating of sustainability performance and ROA or ROE "cannot be expected" because of different accounting methods used in the different countries represented in the data sample.

Eccles et al. (2013) found that firms that had been early adopters of sustainability policies had greater ROE and ROA over the long term as compared to firms that had not.

Table 2-2 summarizes all of the findings from the literature review.

[2] The logarithm return is used to normalize rate of returns with compounding interests. "Using log prices… converts an exponential problem to a linear problem" (mathestate).

Table 2-2
Summary of research papers

Note: The table below summarizes the results of the fourteen individual research papers reviewed. For definitions of terms used, including the KLD database's "strengths" and "concerns" categories, see Table 2-1 above. The "Statistical Significance" column indicates whether a statistically significant relationship was found between the proxy for sustainability, and the proxy for firm performance. "Statistical Significance" is indicated when the paper noted results as "significant," "highly significant," "significant at the 5% level," or "significant at the <1% level;" otherwise "not significant" is noted. The cells in the table below are split to indicate the multiple analyses conducted in the studies. Unless otherwise noted, the directionality of the relationship is in the expected direction of the hypothesis, which was generally: as sustainability performance increases, firm performance increases; or as sustainability performance decreases, firm performance decreases.

Study and Focus	Proxy for Sustainability	Proxy for Firm Performance	Statistical Significance	Study Sample
Bassen et al., 2006 ESG	Unique calculated "corporate responsibility" (CR) ranking based on 38 CR measures, weighted by financial industry perceptions of importance	Return on equity (ROE)	Not significant	44 utilities[3] from MSCI World Index, close to half from U.S., and half from U.K.
		Return on asset (ROA)	Not significant	
		S&P 500 credit rating of corporate bonds	Significant	
		log return of market-based financial performance	Significant	
		β (beta, a market-based risk measure)	Significant	
Bauer and Hann, 2010 ESG	Aggregated environmental strengths indicators from KLD ESG database	Bond spread	Environmental strengths: significant Environmental concerns: significant	582 U.S. public corporations
	Aggregated environmental concerns indicators	S&P 500 credit rating of corporate bonds	Environmental strengths: significant Environmental concerns: significant	

[3] Global Industry Classification Standard Code 5510/Utilities.

Study and Focus	Proxy for Sustainability	Proxy for Firm Performance	Statistical Significance	Study Sample
Bauer et al., 2009 Social indicators	Aggregated social "Employee Relations Index" (diversity management and employee relations indicators) from KLD ESG database	Bond spread	Significant	568 U.S. public firms
		S&P 500 credit rating of corporate bonds	Significant	
Chava, 2011 Environmental indicators	Aggregated net environmental concerns and environmental strengths indicators from KLD ESG database	Cost of equity (analysts' earnings estimates that indicate demand for higher returns to mitigate risk)	Net environmental concerns: significant Environmental strengths: not significant	Cost of equity analysis: number not given, only that the regression considered all those firms with data available on both the KLD database and private firm performance databases (CRSP, COMPUSTAT, I/P/B/E/S) Bank loans: analyzed 5,879 bank loans
	Individual environmental indicators		Individual environmental indicators: significant for climate change concerns, toxic emissions, significant hazardous waste concerns, clean energy products; not significant for environmentally beneficial products, pollution prevention	
		Bank loan spread	Net environmental concerns: significant Environmental strengths: not significant	
			Individual environmental indicators: significant for climate change concerns, toxic emissions, hazardous waste concerns	
Cheng et al., 2011	Composite ESG index from indicators from Thompson Reuters ASSET4 database	Capital constraints (inability to fund all desired investments)	ESG index: significant	Over 400 firms from 49 countries

Study and Focus	Proxy for Sustainability	Proxy for Firm Performance	Statistical Significance	Study Sample
ESG (aggregated, separate) and Governance indicators	ESG pillars, grouping indicators for E, S, and G		ESG pillars: significant for environmental and social pillar; not significant for governance	
	Rating of stakeholder engagement (from ASSET4)		Stakeholder engagement: significant	
	Rating of disclosure (from ASSET4)		Disclosure: significant	
Dhaliwal et al., 2011 ESG and Governance indicator	Voluntary disclosure of CSR activities (e.g., publishing a stand-alone CSR report)	Cost of equity capital	Disclosure: not significant Disclosure of firms with higher ESG performance: significant	213 U.S. firms that published a stand-alone CSR report between 1993-2007
	ESG strengths aggregate score (from KLD database) for disclosing firms			
Eccles and Serafeim, 2013 ESG	ESG performance (undefined)	Financial performance (undefined)	No specific significance figures were cited	Over 3,000 organizations
Eccles et al., 2013 ESG	A "high sustainability" portfolio (firms that voluntarily adopted policies in the early 1990s), from the ASSET4 database	Stock market performance over the long-term (1993-2010)	Significant	Matched sample of 180 companies – "high sustainability" vs. "low sustainability" (no adoption of policies)
		ROE	Significant	
		ROA	Significant	
Edmans, 2011 Social indicator	Employee satisfaction as indicated by a portfolio of companies in "100 Best Companies to Work for in America"	Long-run stock returns	Significant	"100 Best Companies to Work for in America" from 1984-2009, compared to industry benchmark

Study and Focus	Proxy for Sustainability	Proxy for Firm Performance	Statistical Significance	Study Sample
Ghoul et al., 2011 Social indicators	Six aggregated social indicators from KLD ESG database. Tested as above median and below median aggregate social score.	Implied cost of capital / ex ante cost of equity	Aggregated social indicators: significant	"12,915 observations representing 2,809 unique [U.S.] firms between 1992 and 2007"
	Individual social indicators from KLD ESG database		Individual social indicators: significant for employee relations, environmental performance, product characteristics; not significant for community relations, diversity, human rights	
Goss and Roberts, 2011 ESG	Aggregated environmental strengths and concerns indicators from KLD ESG database. Tested separately below-average performance firms vs. above-average firms.	Bank loan spread	Significant	3,996 banks loans to 1,265 U.S. firms from 1991-2006
	ESG strengths		ESG strengths: not significant "Low-quality" borrowers[4] + ESG strengths: significant (loan rates increase as investments in ESG strengths increase)	
	ESG concerns		ESG concerns: significant	

[4] The proxy for "low quality" borrowers was a loan that had to pledge collateral.

Study and Focus	Proxy for Sustainability	Proxy for Firm Performance	Statistical Significance	Study Sample
Konar and Cohen, 2001 Environmental indicators	Aggregate pounds of toxic chemicals emitted (from the EPA-mandated reporting on the Toxic Release Inventory, or TRI) normalized by dollar value of firm.	Intangible asset value (indicated by Tobin's q, or market value divided by replacement value)	Significant	233 U.S. firms from the S&P 500
	Number of environmental lawsuits pending in 1989		Significant	
Nandy and Lodh, 2012 Environmental indicators	Aggregated net environmental concerns from KLD ESG database	Bank loan spread	Significant	1,000 U.S. firms
Weber et al., 2010 SRI	Portfolio of Socially Responsible Investment (SRI) funds vs. MSCI World Index.	Monthly returns	Significant	151 SRI global funds, matched to MSCI World Index, between 2001-2009
		Monthly returns – bull phase (April 2003-May 2007) vs. bear phase (June 2007-March 2009)	Significant	
		Monthly returns of SRI funds, considering a financial rating	Significant	
	Unique sustainability rating, developed in part from information from Centre Info ESG Equity Research database of CSR performance	Monthly returns of SRI funds	Significant, but negative (as sustainability rating increases, monthly returns of SRI funds decrease)	

Meta-Analyses

The literature review of individual studies revealed that the majority of analyses found significant relationships between sustainability characteristics and a firm's financial performance. However, we wondered if the sample of studies selected may have unwittingly been biased, since many were sourced from a meta-analysis concluding positive business outcomes from sustainability investments. Additionally, limiting the sample to analysis conducted over the last 15 years provided for timely conclusions, but perhaps did not present an accurate picture of the history of the research. It accounts, for example, for the preponderance of studies on sustainability and cost of capital, which appears to be a relatively new line of inquiry (post-2004). Finally, research in this area may be more conflicting than our sample suggests. For example, Cheng et al. (2011) note, "the extant research so far has failed to give a definitive answer… [as to] whether CSR leads to value creation" (p.2). To balance potential bias, two highly-cited meta-analyses that gathered literature prior to 2001 were added: Margolis and Walsh, 2003;[42] and Orlitzky et al., 2003.[43] Finally, summaries of more recent meta-analyses were provided (Deutsche Bank, 2012; and Pavie and Filho, 2008[44]).

"If social performance is contributing to financial performance, then the firm is being used to advance the objective for which it is considered to be best suited, maximizing wealth." -Margolis and Walsh, 2003

Margolis and Walsh provide introspection at a high level on the role of a corporation with regards to support of sustainability issues. The authors investigated whether spending on sustainability performance maximizes shareholder wealth. The authors analyzed 127 published studies investigating the relationship between corporate sustainability performance and financial performance from 1972-2002, and categorized each as showing a significant and positive relationship (54 studies), non-significant relationship (28 studies), significant and negative relationship (7 studies), or mixed relationship (20 studies). Of the seven studies showing negative relationships, six reviewed the market performance of funds with investment screens (e.g., screening out alcohol, tobacco, or South African investments). The authors noted: "If social performance is contributing to financial performance, then the firm is being used to advance the objective for which it is considered to be best suited, maximizing wealth."[45]

From their analysis of 62 published studies, Orlitzky et al. (2003) found a significant and positive relationship between sustainability and financial performance.

Margolis and Walsh also tested a subset of data to understand whether financial performance followed corporate sustainability performance, or vice versa (the "slack resources" theory, which implies that good financial performance allows excess resources to be spent on corporate social programs). In 22 studies that examined financial performance as a consequence of sustainability performance, the authors found that 16 studies had a significant positive relationship. The authors conclude, "A clear signal emerges from these 127 studies. A simple compilation of the findings suggest that there is a positive association, and certainly very little evidence of a negative association, between a company's social performance and its financial performance" (p.277).

Orlitzky et al. analyzed 62 published studies from 1972-1997 with 388 correlations based on 33,878 observations. In one of the hypotheses tested, the authors found that much of the variation between findings in studies – 24% –

could be explained by study design ("study artefacts, stakeholder mismatching, other theoretical mis-specifications, or lack of theory," p.422). The authors were critical of Margolis and Walsh's meta-analysis, which they noted used a "vote-counting" technique (e.g., coding the studies positive, negative, etc.) that "has been shown to be invalid by many statistical experts" (p.404). The Orlitzky study used a psychometric meta-analysis that could "statistically aggregate results across individual studies and correct for statistical artefacts such as sampling error and measurement error" (p.404).

From the overall sample of 388 correlations, Orlitzky et al. (2003) found a significant and positive relationship between sustainability and financial performance. The correlation was stronger when looking at a subset of the data (177 correlations) that found a positive relationship between corporate reputation and market return or sales growth. The authors also tested the directionality of sustainability and financial performance. They found identical correlations in both, confirming the authors' idea of a "virtuous cycle" between financial and social performance. The authors noted: "We can, therefore, state with some confidence that the association between CSP [corporate social performance] and lagged CFP [corporate financial performance] is not negative. Moreover, the causation seems to be that CSP and CFP mutually affect each other through a virtuous cycle: financially successful companies spend more because they can afford it, but CSP also helps them become a bit more successful."[46]

Orlitzsky et al. (2003) also tested the directionality of sustainability and financial performance. They found identical correlations in both, confirming the authors' idea of a "virtuous cycle" between financial and social performance. -Orlitzky et al. 2003

One of the interesting differences between the studies analyzed in these two meta-analyses and the more recent individual studies are the proxies used for sustainability. In both meta-analyses, only a small portion of the total number of studies used sustainability indicators from the KLD ESG database (4 out of 62 studies in Orlitzky et al. and 12 out of 127 in Margolis and Walsh), while the majority (9 of 14) of the later studies analyzed in this report utilized this or the Thomson Reuters ASSET4 database of ESG indicators. There was overall a greater variation in the proxy of sustainability indicators used in the studies reviewed by Orlitzky et al. and Margolis and Walsh, which reviewed research from 1972-2001. The proxies included:

- Simple indicators of disclosure (a dichotomous notation of whether a firm generally discloses or not, or discloses on a particular subject; or number of disclosures).
- Council on Economic Priorities Index.
- Fortune magazine reputation score.
- Unique corporate responsibility ratings or surveys.
- TRI data (in studies after 1993).
- Charitable contributions.
- South Africa divestment.

Turning to the more recent meta-analyses, a 2012 Deutsche Bank study reviewed 62 academic studies on sustainability and financial performance. The authors categorized the studies into research examining corporate social responsibility

A 2012 Deutsche Bank study found that of 19 studies examining links between sustainability and cost of capital, all found positive correlations.

(CSR), SRI, or ESG and market-based performance, account-based performance, or cost of capital (see Table 1-1 for definitions). The authors then reported the number of studies finding positive, neutral, mixed or negative correlations. All 19 of the studies examining links between sustainability and cost of capital found positive correlations, and the authors noted "This finding alone should put the issue of sustainability squarely into the office of the Chief Financial Officer, if not the board, of every company" (p.5). Also, 15 out of 18 studies examining links between sustainability and market performance found positive correlations, along with 10 out of 12 studies examining sustainability and accounting-based performance. Studies examining market-based performance of SRI found neutral or mixed results (seven out of eight studies). Overall, the authors noted the greater correlations with the ESG "best in class" approach – meaning, examining firms which perform best on ESG metrics – over an SRI "screening out" approach (e.g., mutual funds which screen out tobacco, alcohol, etc.).

Finally, a meta-analysis by Pavie and Filho (2008) included 112 studies published from 1998-2007 and "results show positive relations between the various measures analyzed of corporate social responsibility and financial performance" (p.1). However, even though the title of the article is "Corporate Social Responsibility and Financial Performance: A Meta-Analysis," a large number of the original articles included in the analysis appeared to diverge from the traditional concept of sustainability. For illustration, some of the original papers included in the analysis were: "The Financial Rewards of New Product Introduction in the Personal Computer Industry," "Narcissistic Chief Executive Officers and their Effects on Company Strategy and Performance," and "The Information Intermediary Role of Short Sellers." It is possible that the authors' literature review search terms returned articles landing firmly on the financial performance side, instead of linking financial performance to sustainability proxies. This experience highlights the importance of study design on deriving meaningful insights into correlations between sustainability and financial performance.

This review of meta-analyses reveals several insights:

- The choice of the sustainability proxy has contributed to questioning the conclusions of some studies. Deutsche Bank suggests that SRI funds are not a good indicator of sustainability, because companies in the funds may not be chosen based on sustainability performance. The review of Pavie and Filho noted above also underscores the critique of sustainability proxies.
- Moreover, studies prior to the introduction of the KLD ESG database in 1991 had more variability in the proxies of sustainability. Later studies (reviewed above) have converged much more towards using ESG data from KLD or Thompson Reuters. The more recent emphasis on use of ESG data suggests a need to more fully understand the underpinnings of these datasets.
- Study design can account for a significant amount of variation between studies: Orlitzky et al. (2003) found that 24% of the variation could be accounted to study design.

- Both of the 2003 highly-cited meta-analyses found positive relationships between corporate sustainability and financial performance. Margolis and Walsh, however, found not only studies with significant positive correlations (54 studies), but also studies with non-significant relationships (28 studies), significant and negative relationships (7 studies), and mixed relationships (20 studies).

Summary of Literature Review

There is a growing body of academic literature examining potential correlations between sustainability and financial performance. While many of the studies analyzed found statistically significant and positive correlations, not all academic studies agree. Active research and academic debate are ongoing, and will likely be enhanced by increased transparency in sustainability indicators and metrics. We find the following insights from the literature:

Insights from the literature review include:

- Significant relationships between sustainability and cost of capital.
- A possible long-term nature of financial returns from sustainability.
- Some of the debate in the literature may be attributed to the choice of sustainability proxy.

- There is a relatively new set of literature that finds significant positive correlations between sustainability and cost of capital. Eight of the fourteen individual analyses that we reviewed looked at cost of capital, and all found significant relationships.
- Returns on sustainability investments may be long-term in nature. Five of the studies we examined used long-term data (between an 8-year to 25-year period) and all found significant relationships such as better market performance for more sustainable firms (Eccles et al., 2013; Edmans, 2011; Ghoul et al., 2011; Goss and Roberts, 2011; Weber et al., 2010). In addition to finding that firms who were early adopters of sustainability policies were more profitable, Eccles et al. (2013) also found that these firms were fundamentally different in longer-term orientation, governance structure, stakeholder engagement, and voluntary disclosure. The addition of databases for ESG data (KLD beginning in 1991 and ASSET4 beginning in 2002) appears to have made it easier to gather and analyze large datasets over long time periods.
- The choice of the sustainability proxy has contributed to questioning the conclusions of some studies. Deutsche Bank suggests that SRI funds are not a good indicator of sustainability, because companies in the funds may not be chosen based on sustainability performance. The review of Pavie and Filho noted above also underscores the critique of sustainability proxies. In their meta-analysis of 62 studies. Orlitzky et al. (2003) found that 24% of the variation of findings between studies could be attributed to study design.

In academic articles, authors provide their own "business case" for sustainability.

In addition to these insights, the authors of the research reviewed often provided their own "business case" for sustainability. Eccles et al. (2013) argue that integrating sustainability issues "into a company's business model and strategy may be a source of competitive advantage," and provide the following linkages to a business case: "a more engaged workforce, a more secure license to operate, a more loyal and satisfied customer base, better relationships with stakeholders, greater transparency, a more collaborative community, and a better ability to innovate." Bauer and Hann (2010) cite literature arguing that "an engagement beyond compliance standards can improve production efficiency, increase

demand from environmentally sensitive consumers, discourage stakeholder activism, and help firms to attract skilled workers."

The next section incorporates findings from the literature review into a summary of the business case organized around three themes: saving money, making money, and managing risk.

Section 3: Executive Rationale

This section focuses on a practical challenge: how to communicate the business case for sustainability in internal discussions, especially to senior-level management. The section addresses the following remaining research question:

- What is the most compelling evidence for executive decision makers that sustainability is valuable?

Ultimately, it is important for a sustainability manager to translate research into relevance for executive decision makers. This section offers a rationale organized around three main themes: saving money, making money, and managing risk. We synthesize findings from the literature review, and add real-world examples from the grey literature (e.g., reports, articles, corporate sustainability reports, and online content), tailored whenever possible for the perspective of an electric power company.

Electric power companies have an opportunity to save money, make money, and manage risk through sustainability actions.

The driver for sustainability varies by organization. The driver for an IOU may be a shareholder resolution, while the driver for a non-IOU may be customer requests. Many electric power companies firmly state that sustainability is part of their company's core values. In a survey of 134 electric utility respondents, 71% noted that sustainability was "part of our core values."[47] Regardless of the driver, electric power companies have an opportunity to save money, make money, and manage risk through sustainability actions.

Saving Money

Opportunities to save money can help companies keep to their core mandate of providing affordable electricity. Below, we examine the linkages between sustainability and savings via reduced cost of capital, employee retention and engagement, and other cost reductions.

Cost of Capital

"Cost of capital" simply means how much it costs to borrow or raise money. On an individual level, a credit score can mean a lower or higher interest rate for a credit card or home mortgage. In an electric power company (IOU and non-IOUs alike), cost of capital comes into play when a company asks a bank, shareholders, or bondholders for funds to build a new plant, substation, transmission line, or other projects.

From the lender's point of view, a more sustainable firm presents less regulatory risk, which translates to lowered risk of default.

From the lender's point of view, a more sustainable firm presents less regulatory risk, which translates to lowered risk of default (or reduced returns). Lenders can even be exposed to litigation risk and costly clean-up of Superfund sites (Chava, 2011). Lenders are also increasingly concerned with their own reputational risk. Seventy-five financial institutions globally have adopted "Equator Principles" and evaluate the environmental and social risk of projects.[48] Spurred by pressure from environmental groups, five banks (Chase, Wells Fargo, PNC, UBS, and Credit Suisse) have adopted policies on mountaintop removal mining practices.[49] Multilateral and nonprofit groups are advocating for the financial sector to consider water scarcity in lending decisions.[50] [51]

Regarding links between sustainability and cost of capital, a 2012 Deutsche Bank report concluded, "This finding alone should put the issue of sustainability squarely into the office of the Chief Financial Officer, if not the board, of every company" - Deutsche Bank, 2012

Recent academic studies provide evidence of a relationship between sustainability and cost of capital. The 2012 Deutsche Bank study reviewing dozens of academic studies on sustainability found 19 examining the link to cost of capital.[52] All 19 studies found that companies with high sustainability ratings had a lower cost of capital. The authors concluded, "This finding alone should put the issue of sustainability squarely into the office of the Chief Financial Officer, if not the board, of every company" (p.5).[53]

For example, two studies found that more sustainable firms are rewarded with 0.07% - 0.56% lower costs of capital than less sustainable firms (Goss and Roberts, 2011;[54] Ghoul et al., 2011[55]). For a multi-million dollar project this can make a significant difference, with the potential for a company to avoid hundreds of thousands of dollars in interest. A 2013 *Forbes* article noted that "the power sector needs $2 trillion for capital expansion over the next 20 years."[56]

In another academic study looking specifically at the utility sector, the authors noted that "electric utilities receive a larger proportion of scrutiny from bondholders, from regulatory agencies, and from a larger community of investors and analysts" (Bassen et al. 2006, p.23[57]). The study found that sustainability performance had a large explanatory effect on credit rating and concluded: "Good corporate responsibility performance can be an indicator for a good credit rating or vice versa" (p.39).[58]

A 2013 Forbes article noted that "the power sector needs $2 trillion for capital expansion over the next 20 years." - Forbes, 2013

Employee Retention and Engagement

Employee turnover is costly. Replacing an employee can cost about 20% of the new hire's first year salary.[59] The energy industry overall is expecting "a massive wave of retirements over the short to medium term, which has been dubbed 'The Great Shift Change'."[60] In the electric power industry, skilled workforce availability is a major sustainability issue.[61] Increasingly, workers may be seeking employers with opportunities to engage in sustainability activities.

A 2012 Net Impact survey found that "employees who say they have the opportunity to make a direct social and environmental impact through their job report higher satisfaction levels than those who don't, by a 2:1 ratio."[62] The claim is also echoed in the literature, where authors have argued that sustainability attracts and retains high quality employees (Turban and Greening, 1997;[63] Greening and Turban, 2000[64]).

In addition to employee recruitment, satisfaction, and retention, corporate sustainability programs present an opportunity to engage employees. A Power magazine article noted:

"…when employees are highly engaged, their companies drive 26% higher productivity, have lower turnover, and are more likely to attract top talent. More impressively, companies of highly engaged employees earned 13% greater total returns for shareholders during the past five years." [65]

Several academic studies found positive correlations between firm performance (stock market returns or cost of capital) and employee relations or being listed on the "100 Best Companies to Work for in America."

Several academic studies found positive correlations between firm performance (stock market returns or cost of capital) and employee relations (Bauer et al., 2009;[66] Ghoul et al., 2011[67]), or being listed on the "100 Best Companies to Work for in America" (Edmans, 2011[68]). No electric power companies were on the Forbes list in 2012, 2013 or 2014.[69] [70] [71]

Other Cost Reductions

Other cost reductions have come from sustainability actions, from energy efficiency and water efficiency, waste reductions, and cost savings related to energy sources. Walmart set a target in 2012 to save $150 million "from sustainability initiatives such as solar and wind energy projects, fuel cell installations, and its zero waste program."[72] Proctor & Gamble noted in their 2012 Sustainability report that "in the past 10 years we have delivered nearly $1 billion from sustainability efforts in our operations."[73]

In the electric power sector, NRG Energy's Seward Power station in Pennsylvania saved $500,000 between 2008-2013 by reducing its water treatment costs by 25%.[74] Xcel Energy noted that their subsidiary Southwestern Public Service Co.'s 2013 wind power deal for 700 MW "will be less than the per-MWh price of most of the company's natural gas-fired generation" and "will save customers $590 million in fuel costs over the next 20 years."[75]

There may be opportunities to find tax savings from a donation of corporate surplus land. Based on bargain sale provisions in the federal tax code, Allegheny Energy claimed a charitable contribution of the eco-asset value of a 12,000-acre parcel, yielding about $5 million in tax savings.

There may also be opportunities to find tax savings from a donation of corporate surplus land.[76] In 2001, Allegheny Energy was considering donating a 12,000-acre parcel that provided various "ecosystem services" like wildlife habitat, water purification and climate regulation into environmental assets. While the traditional real estate appraisal valued the land at $16 million, after including the eco-assets, the value rose to $33 million. The valuation was supported by an independent audit by PricewaterhouseCoopers.[77] [78] The U.S. Fish & Wildlife Service purchased the property at a cost in line with the traditional appraisal value. Based on bargain sale provisions in the federal tax code, Allegheny Energy claimed a charitable contribution of the eco-asset value, yielding about $5 million in tax savings. The transaction was reviewed by the Internal Revenue Service (IRS) during a tax audit, and was approved without modification.[79] Cargill Salt Company similarly found significant tax savings from a valuation and donation of land. Cargill based the value of their 16,500-acre former salt pond parcel on the value of the land for wetland and species mitigation banking, instead of traditional real estate valuation. In 2009, Cargill concurred with an IRS audit on the value of the land at $200 million. They sold the land to the U.S. Fish &

Wildlife Service for $100 million and claimed the $100 million difference as a tax deduction.[80]

Making Money

Of course, saving money is highly correlated with making money. In this section we turn to linkages between sustainability and financial performance, and innovation of business models, products, and processes.

Financial Performance

The socially-responsible investment arena totaled $3.74 trillion in 2010.

The socially-responsible investment arena totaled $3.74 trillion in 2010, up 20% over 2009.[81] There is increased attention to sustainability indicators by analysts and investors. Bloomberg noted that their customer base using their ESG data more than tripled between 2009 and 2012.[82] Recently, a private firm called Target Rock Advisors created an index of sustainable utilities, betting that these "best-in-class" companies will outperform traditional utilities.[83] Figure 3-1 depicts a "back cast" of the Sustainable Utility Leaders Index's performance (in blue) against the S&P 500 (in red) and the S&P Utilities index (in peach).

Figure 3-1
Target Rock Advisors' Sustainable Utility Leaders Index performance back-cast from 2002-2014[84]
Note: y-axis indicates the percent price return (price/price at beginning of the period)

The performance of this particular index mirrors research findings such as Eccles et al. (2013[85]), who found a correlation of long-term outperformance with a "high sustainability" portfolio. The portfolio they constructed was comprised of 180 firms that had adopted sustainability strategies in the early 1990s. When compared to a matched sample, the authors found significant out-performance: the "high sustainability" portfolio had a 4.7% higher annual stock market performance over the "low sustainability" portfolio over the time period 1993-2010. Bassen et al. (2006) also found a market-based risk indicator (β, beta)

significantly correlated to corporate responsibility in a sample of 44 utilities.[86] Within that study, Bassen et al. also found from a survey of 164 utility industry analysts and investors that sustainability was "seen as crucial and was explicitly not seen as 'an overrated trend' but more as 'part of good management'" (p.27).[87]

In a survey of 164 utility industry analysts and investors, sustainability was "seen as crucial and was explicitly not seen as 'an overrated trend' but more as 'part of good management.'"
-Bassen et al. 2006

It should be noted that academic research to date is focused on the **correlation** between sustainability activities and financial performance, and does not confirm a causal relationship. Further, not all academic studies agree on a clear relationship. Some authors argue that contradictory results are due to factors of the research while others argue that spending on sustainability will impair profitability. Frequently-cited meta-analyses (a review and analysis of dozens of past research articles) found overall positive linkages between sustainability and firm performance (Orlitzky et al., 2003;[88] Deutsche Bank, 2012[89]) or overall mixed results (Margolis and Walsh, 2003[90]). Active research and academic debate are ongoing, and will likely be enhanced by increased transparency in sustainability indicators.

Outside of the academic realm, there is a movement in the non-profit and investor arena to identify non-financial, material sustainability issues and their associated metrics that can be linked to the bottom line at the industry level. The implication is that if an issue is "material" to a firm's financials, the issue must be disclosed on the Security and Exchange Commission's (SEC) 10-K form required of every publically-listed corporation. Leading this movement is the Sustainability Accounting Standards Board (SASB), a small non-profit with an ambitious goal, a fast timeline, and backers with significant weight.[91] Among their board members are: Michael Bloomberg (former Mayor of New York City, current President of Bloomberg), Mary Shapiro (former SEC Chair), Elisse Walter (current SEC Chief), Jack Ehnes (Chief Executive, CalSTRS), Peter Knight (Generation Investment Management), Shawn Lytle (Head of Americas at UBS Global Asset Management), and Robert Eccles (Harvard Business School professor and frequently-cited academic research author).[92] SASB will be reviewing the electric utilities sector in 2015.[93]

There is a movement to identify sustainability issues that are "material" to a company.

Innovation (Business Models, Products, Processes)

There is anecdotal evidence that sustainability brings profit through innovation that leads to new business models, new products or business lines, or new processes. A 2012 MIT survey found that 50% of respondents had "changed their business models as a result of sustainability opportunities," an increase of 20% over the prior study conducted in 2011.[94] The study suggested that pursuing sustainability led to new opportunities such as SAP developing products to help clients "optimize energy consumption and natural resource use across their supply chains," or Avis getting into the car-sharing business with the acquisition of Zipcar.[95]

In their long-term study of sustainability and stock-market returns, Eccles et al. (2013) found that firms who were early adopters of sustainability policies were not only more profitable, but were fundamentally different in longer-term orientation, governance structure, stakeholder engagement, and voluntary disclosure.

In their long-term study of sustainability and stock-market returns, Eccles et al. (2013[96]) found that firms who were early adopters of sustainability policies were not only more profitable, but were fundamentally different in longer-term orientation, governance structure, stakeholder engagement, and voluntary

disclosure. In a later article, Eccles and Serafeim (2013[97]) argue that only sustainability activities that are focused on "material" issues *and* "produce major innovations in products, processes, and business models" will lead to higher financial performance (p.52[98]).

In the electric utility industry, new business models are emerging. EPB Electric Power, described as a community-owned municipal distribution company based outside Chattanooga TN, built a smart grid and started offering communication services: high-speed internet, and new options for television and phone service. The $57 million that was generated by their new fiber optics business line was "the equivalent of a 4% rate increase for EPB Electric Power customers that did not have to happen."[99] They are also reaping $10.5 million annually in operational efficiencies.

Thirteen states are seeing new offerings for electric power customers, with plans akin to those offered by cell phone service providers: prepaid plans, free nights, and free weekends.[100] The J.D. Power 2013 Electric Utility Residential Customer Satisfaction Study found that companies ranked higher when they offered engaging programs, including level or equal pay plans.[101]

Managing Risk

In EPRI's 2013 research, two-thirds of electric power respondents said that sustainability is important to manage regulatory or operational risk, and to strengthen corporate reputation.
– EPRI, 2013

In the cost of capital section above, research indicated a link between sustainability and the price of borrowing or raising money. Implicit in those studies was an acknowledgement that lenders understand that more sustainable firms are managing regulatory, reputational, or other risks. In EPRI's 2013 research, two-thirds of electric power respondents said that sustainability is important to manage regulatory or operational risk, and to strengthen corporate reputation.[102] Figure 3-2 below shows the expected trends in importance of sustainability issues over five years, from the perspective of the utility industry (blue) and external stakeholders (red).

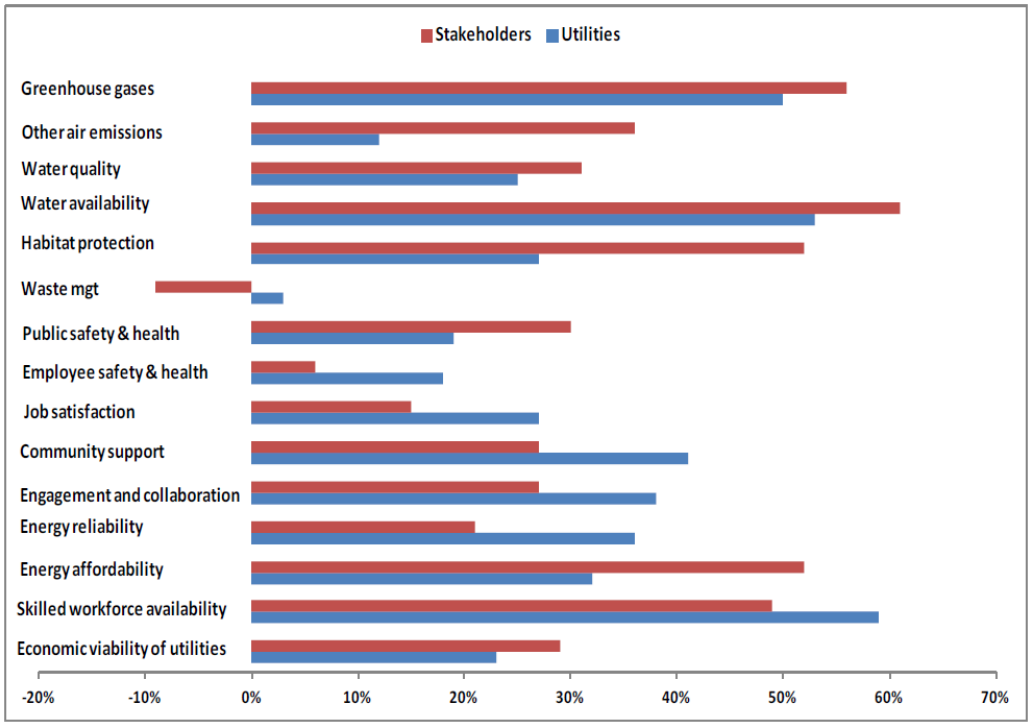

Figure 3-2
Expected trends of importance of sustainability issues over five years[103]

In this section, we further explore the perspective of corporate risk management, specifically regulatory and reputational risk.

Regulatory Risk

Regulatory risk refers to the risk of exceeding current regulations, tightening of existing regulations, or entirely new regulations. Activities to address sustainability issues can help electric power companies maintain compliance, avoid fines, build goodwill with regulatory stakeholders, and reduce the time needed to adjust operations to comply with new regulations.[104] The experience and expertise gained from addressing issues in a pre-compliance situation can provide credibility should policy-making come to pass.

Regulatory risk is also linked to cost of capital, and the discussion in that section of this report noted multiple academic studies linking lower environmental and social sustainability concerns with lowered cost of borrowing or raising funds.

Heal (2004) provides interesting insight about regulatory risk:

> "In cases where [environmental and social] costs are externalized, corporations bargain with society about who will bear these costs. The corporation is not – currently – legally bound to bear them but society could change this if it wished, and indeed could go further and

impose penalties for the past externalization of costs. The result is an implicit contract: society accepts the status quo provided that the corporation does not exploit it to society's disadvantage." (*in* Goss and Roberts, p. 1794[105]).

Reputational Risk

As company value is increasingly composed of intangible assets, reputational risk is an important consideration, as shown in Figure 3-3. Intangible assets include intellectual property, human capital, goodwill and brand recognition, as opposed to tangible assets like property, plant and equipment.

OceanTomo (2014, 2015) found that the intangible value of a firm has increased from 17% of a firm's value in 1975 to 84% in 2015.

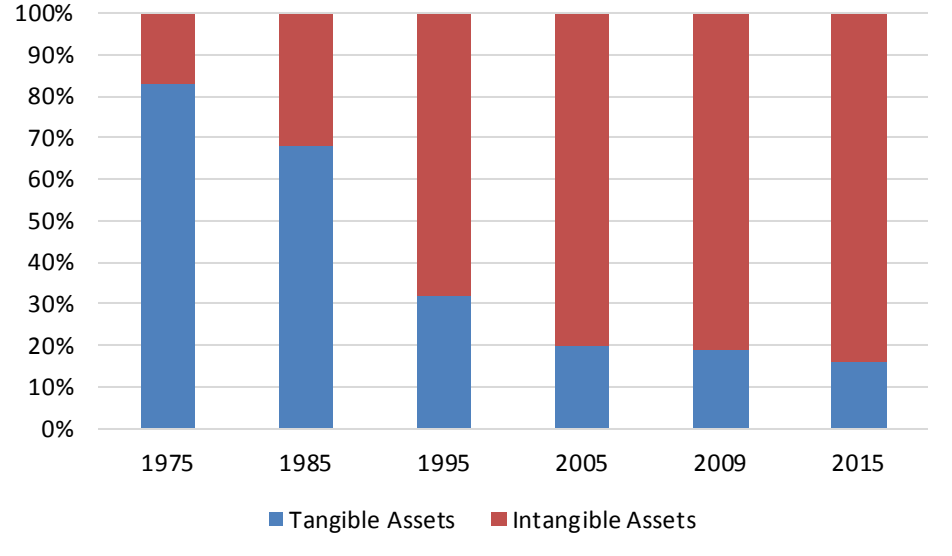

Figure 3-3
Components of S&P 500 market value
Data source: OceanTomo, 2014[106] and 2015[107]

Scholars argue that corporate sustainability can "contribute towards gaining social legitimacy" (Cheng et al., 2011, p.5[108]), and can create "moral capital, which provides insurance-like protection" (Bassen et al., 2006, p.12[109]) and safeguards shareholders' interests.

In 2014, 417 shareholder resolutions were filed on environmental, social, and governance issues across all industries.

Action on sustainability could also affect reputation with shareholders. In 2014, 417 shareholder resolutions were filed on environmental, social, and governance issues across all industries.[110] Table 3-2 shows a sample of resolutions with electric power companies in 2014.

Table 3-1
2014 shareholder resolutions with electric power companies
Source: Ceres, 2014[111] and Proxy Preview 2014[112]

Company	Topic of Resolution
Ameren	Climate Change; Energy Efficiency (utilities); Greenhouse Gas Emissions; Renewables
American Electric Power Co., Inc.	Climate Change; Energy Efficiency (buildings); Public Policy
CMS Energy Corp.	Climate Change; Energy Efficiency (utilities); Greenhouse Gas Emissions; Renewables
DTE	Political Activity (campaign spending proposal)
Duke	Political Activity (campaign spending, lobbying proposals)
Entergy	Environment (Greenhouse Gas reduction target reporting, nuclear plant safety proposals)
Dominion Resources, Inc.	Three resolutions on Climate Change; Greenhouse Gas Emissions; Governance
FirstEnergy Corp.	Climate Change; Energy Efficiency (utilities); Greenhouse Gas Emissions; Renewables; Lobbying proposal
PG&E	Governance (proposal to establish board committee on risk); Other (proposal to allow opt-out of energy efficiency programs)
Southern Company	Environment (Greenhouse Gas reduction target reporting)

Increased attention to sustainability and reputational risk may be a driver of the increased voluntary disclosure of sustainability information. Few sustainability reports were published in the U.S. prior to the mid-1990s, growing to about 300 reports in 2007 (Dhaliwal et al., 2011[113]). In 2013 reportedly 499 of the S&P 500 reported some form of sustainability disclosure.[114] Sustainability reports allow companies to transparently communicate not only raw data but also their sustainability narrative to better inform stakeholders of the value, implications, and strategic approach to managing and influencing that data.

It is important to recognize the intricate linkages between sustainability issues and risks, and the attention to balancing tradeoffs of managing risks.

Finally, it is important to recognize the intricate linkages between sustainability issues and risks, and the attention to balancing tradeoffs of managing risks. An example of an overlapping risk is the issue described as the "energy-water nexus," referring to demand for water for power generation in areas of water scarcity.

Both the Union of Concerned Scientists[115] and Environmental Defense[116] [117] [118] [119] have voiced this topic as an issue, and have gained the attention of the National Association of Regulatory Utility Commissioners.[120] The National Association of Regulatory Utility Commissions passed a resolution in March of 2013 supporting "water-smart energy choices."[121] Concurrently, the Department of Energy released two reports on the topic: "Energy Sector Vulnerabilities from Climate Change and Extreme Weather" in 2013[122] and "Water-Energy Nexus" in 2014.[123] On the international front, in 2013 the World Bank launched a "Thirsty Energy" initiative, which "quantifies tradeoffs and identifies synergies between water and energy resource management."[124] The energy-water nexus topic is a good example of the "nexus" of reputational, regulatory, and operational risk that could be addressed with a sustainability strategy.

Section 4: Conclusions

EPRI's Electric Sustainability Interest Group (ESIG) asked EPRI to research the business case for sustainability. After conducting a literature review and summarizing the information for executive decision-makers, we provide the following conclusions to our original research questions.

Is corporate sustainability linked to financial performance?

From a review of 18 studies, there are academic studies that find statistically significant correlations between corporate sustainability and financial performance and there are other studies that find no significance. Active research and academic debate are ongoing, and will likely be enhanced by increased transparency in sustainability indicators and metrics. Tracking new developments in this body of research will be important to understand if the academic community comes to consensus on any issues, in particular the link between sustainability and cost of capital.

As noted above, all individual studies controlled for well-known factors that could affect the proxy of firm performance, such as: firm size, total assets, earnings normalized by assets, leverage (debt/assets), market share of the firm, and country (an indicator of level of regulation, required disclosure, accounting method). None of the studies purported to show causal relationships, but this is not uncommon in the non-physical sciences, including economics research. Establishing causality requires proof of the effect occurring after the cause. This may be relatively easy in a controlled laboratory experiment, but becomes nearly impossible to prove in real-world scenarios with multiple potential confounding variables.

The most notable finding of the literature review was the relatively new body of research investigating the link between sustainability performance and cost of capital. Of the eight individual analyses we reviewed in this area, all found significant relationships. Deutsche Bank noted of these correlations: "This finding alone should put the issue of sustainability squarely into the office of the Chief Financial Officer, if not the board, of every company" (p.5). Many of the studies reviewed relied on sustainability data from KLD or Thompson Reuters. The more recent emphasis on use of sustainability data suggests a need to more fully understand the underpinnings of these datasets.

We summarized all of the research reviewed in Table 2-2. If time allows for reading a subset of literature, the following may be useful to consider:

- Eccles et al. (2013) is a robust and insightful example of research on stock market performance of more sustainable firms over the long term.
- Bauer and Hann (2010) is a good example of a cost of capital study and a good example of use of KLD ESG data. The study was awarded the Moskowitz prize, an annual award associated with the UC Berkeley Haas School of Business that recognizes outstanding quantitative research in socially responsible investing.[125]
- Orlitzky et al. (2003) is a frequently-cited meta-analysis finding overall significant and positive relationships from 388 separate correlations found in 62 studies on sustainability and financial performance linkages from 1972-1997.

None of the research reviewed focused specifically on the correlations between sustainability and financial performance in the electric utility industry. New research could follow the methodology of past research but be tailored to look specifically at the electric power industry. We also note a lack of research on the practical trade-offs of balancing environmental, social, and economic considerations. Further investigation could frame the tradeoff issue and develop tools for corporate management and decision making.

What is the return on investment (ROI) for specific sustainability actions?

Several studies "teased out" which of a group of sustainability metrics were more significant than others (see at right).

Regarding this question, there were no studies that identified specific actions linked to a specific return on investment. However, several studies "teased out" which group of sustainability metrics were more important than others. Indicators related to environmental concerns such as TRI emissions, hazardous waste liabilities, and environmental lawsuits were found to be significantly related to firm performance (Chava, 2011; Konar and Cohen, 2001). Other individual indicators that were found to be significant were: clean energy products (Chava, 2011); stakeholder engagement (Cheng et al., 2011); disclosure (Cheng et al., 2011; Dhaliwal et al., 2011); employee relations/satisfaction (Edmans, 2011; Ghoul et al., 2011); and environmentally-beneficial product characteristics (Ghoul et al., 2011).

Several studies "plugged in" figures into regression models to show the effect of a change in sustainability on financial performance (see at right).

Regarding ROI, the studies occasionally "plugged in" figures into the regression models to show the effect at the mean level of all the variables, or to predict effects from a marginal change in a variable of interest. Bauer et al. (2009) created an "Employee Relations Index" made up of multiple social indicators and noted that a one-point increase in their index, "given… the median bond issue size is $300 million" is predicted with the model to be related to a "$60,000-$120,000 decrease in annual interest expense" (p.14). Konar and Cohen noted that "a 10% reduction in emissions [pounds] of toxic chemicals results in a $34 million increase in market value" (p.281). The authors also used their regression model to calculate an average "liability" of $380 million associated with TRI emissions and environmental lawsuits. Overall, specific activities that link to

financial performance are still being studied with various approaches currently being assessed.

Another insight was that returns on investment may be long term in nature. Five studies that used long-term data (an 8-year period up to a 25-year period) all found significant relationships such as out-performance in the market for more sustainable firms.

What is the most compelling evidence for executive decision makers that sustainability is valuable?

Section 3 of the report focused on communicating the value of sustainability within an electric power company, with the objective of providing information that sustainability managers can use to discuss with senior management.

The section drew on research from the literature review, but also added real-world examples from the grey literature (e.g., reports, articles, corporate sustainability reports, and online content), tailored whenever possible for the perspective of an electric power company. From this information, we proposed that the most compelling business case for sustainability from the research can be summarized into three opportunities: saving money, making money, and managing risk. The background information, quotes, and case studies can all be put to practical use for internal communication within an electric power company. As new examples and case studies emerge, it will be important to revise learnings, particularly with examples from the electric power industry.

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