



Driving Revenue Growth Through Sustainable Products and Services



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Driving Revenue Growth Through Sustainable Products and Services

RESEARCH REPORT R-1583-KBI

by Thomas Singer



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Introduction

A corporate sustainability program can be more than just a commitment to adhering to the best environmental, social, and governance (ESG) standards in the field; it can drive innovation and be a key element of a company's growth strategy. As corporate sustainability practices evolve and mature from isolated initiatives focused on compliance and environmental footprint reduction to more integrated sustainability strategies that align with a company's core business, there is an increasing recognition of the potential of sustainability initiatives. This report aims to further the conversation by illustrating some of the ways companies are recognizing this potential and driving topline growth through sustainability.

Specifically, this report examines the extent to which sustainability is generating revenue, providing business growth opportunities, and stimulating innovation in products and services among a subset of members of the S&P Global 100 with quantitative and qualitative analysis. From a quantitative standpoint, the research focuses on the contribution of sustainable products to overall company revenues, as well as changes in this contribution over time. In addition, the analysis examines research and development (R&D) investments allocated to sustainability initiatives to offer insights on the time horizon and profitability of those investments. The quantitative review is complemented with 12 company profiles that illustrate specific examples of company initiatives related to sustainable product innovation.¹

Research from The Conference Board Initiative on Sustainability

The Conference Board has been conducting research in the area of corporate sustainability for more than a decade, in response to the increasing interest by corporate executives in stakeholder engagement and social responsibility. Since 2012, through collaborations with NASDAQ, NYSE, Bloomberg, and the Global Reporting Initiative (GRI), The Conference Board has introduced and expanded a set of benchmarking reports to assist companies in the peer comparison of their disclosure and performance across a wide variety of environmental, social, and governance (ESG) practices.

For additional information on these benchmarking reports and other research in the area of corporate sustainability, please visit: www.conferenceboard.org/sustainability.

¹ Many, but not all, of the companies with featured profiles are also included in the sample for the quantitative analysis in this report. Companies that are included in the profiles but not in the quantitative analysis generally do not track or report revenues from sustainable products and services separately, but are nonetheless great examples of companies that recognize the positive impact sustainability initiatives can have on driving topline growth.

This report addresses the following key questions:

- How much revenue are some members of the S&P Global 100 generating from portfolios of sustainable products and services? How has this changed over time?
- How much R&D investment are these companies allocating to sustainability? How has this changed over time?
- What are some industry-specific examples of company initiatives driving sustainable product innovation?
- What lessons can be learned from companies that have successfully launched sustainable product portfolios?

A word of caution: the data this research is based upon remain limited and largely unstandardized. Few companies have developed reporting for a stand-alone group of sustainable products and even fewer track revenues and R&D spending associated with these portfolios. Even when companies track these figures, variations in how these portfolios are defined by the companies make perfect comparisons impossible. Despite significant advancements in guidelines and standards related to corporate sustainability reporting, this area of corporate sustainability is still nascent, leaving companies to operate under their own guidelines and methodologies. This research acknowledges the “wild west” nature of this evolving field and the efforts of a small but growing group of companies that are trailblazers within it. This report should be considered within this context and viewed as an attempt to quantify the contribution of sustainable products to company growth.

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Key Findings

Sustainable products represent a growing share of revenues from companies in our sample, and on average, account for 21 percent of total revenues

In 2013, sustainable products contributed an average of 21 percent of total revenue across the 12 companies in our sample, compared to 18 percent in 2010, an increase of 17 percent. There are some significant variations by companies across industries. For example, the five industrial companies in our sample generated one-third of revenues from sustainable products and services on average. Meanwhile, the three chemical companies in our sample generated nine percent of revenue from their portfolios of sustainability advantaged products and services on average.

Among companies in our sample, revenues from sustainable products and services grew at six times the rate of overall company revenues Between 2010 and 2013, revenues from sustainable products and services among sample companies grew by 91 percent, while overall company revenues grew by 15 percent. Revenues from these products and services have in most cases significantly outpaced overall company revenues.

A few companies have published measurable sustainable product revenue goals, helping spur growth of these portfolios by incorporating sustainable products into strategic planning and target-setting All but one of these goals are set to be realized by 2015, and the majority of them have already been achieved. While these achievements are consistent with the strong growth of sustainable product portfolios, they also point in part to an opportunity for more ambitious goal-setting, particularly as companies begin the process of setting new, post-2015 goals.

Inclusion in portfolios of sustainable products and services is in most cases determined by a product's performance across a set of environmental criteria In many cases, these portfolios focus on climate change mitigation (e.g. reductions in greenhouse gas or GHG emissions), energy usage and efficiency, and resource and materials usage (e.g. use of renewable materials and chemical management). Product life cycle analysis also plays an important part in determining inclusion in these portfolios.

Table 1.1

Revenue from Sustainable Products and Services as a Percentage of Total Revenue

Company (Industry)	2010	2011	2012	2013	2014
Caterpillar (Industrials)*	n/a	n/a	17%	18%	18%
GE (Industrials)	21%	22%	25	30	31
Philips (Industrials)	36	39	46	50	52
Siemens (Industrials)	41	42	43	43	46
Toshiba (Industrials)	n/a	5	12	25	n/a
BASF (Chemicals)	12	9	10	9	n/a
Dow Chemical (Chemicals)	4	5	7	10	n/a
DuPont (Chemicals)	5	6	6	7	n/a
Panasonic (Household durables)†	n/a	10	13	10	22
Kimberly-Clark (Household products)	10	13	22	37	n/a
Johnson & Johnson (Pharmaceuticals)	n/a	n/a	n/a	11	11
Allianz (Insurance)	n/a	n/a	n/a	1	1
AVERAGE	18%	17%	20%	21%	26%

*Caterpillar's 2012 figures are the company's unreported estimates and were not verified through auditing protocol, unlike figures for more recent years.

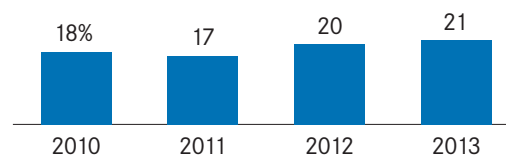
†The significant increase from 2013-2014 is due to an expansion of the definition of products included in Panasonic's portfolio.

Notes: "n/a" for figures from 2010 to 2013 indicates data were not tracked at that time. For 2014, "n/a" indicates figures were not available at time of publication but may be forthcoming. Data for 2014 are shown in the table for reference but not depicted in aggregate in charts or included in our analysis.

Chart 1.1

Revenue from Sustainable Products and Services as a Percentage of Total Revenue (AVERAGE)

Sustainable products and services accounted for 21 percent of total company revenues in our sample in 2013, up from 18 percent in 2010



Sources: Figures were calculated by The Conference Board with data from the following company-defined portfolios: Caterpillar "Sustainable Progress," GE "Ecomagination™," Philips "Green Products," Siemens "Environmental Portfolio," Toshiba "Excellent ECPs," BASF "climate protection products," Dow Chemical "products highly advantaged by sustainable chemistry," DuPont "products that reduce GHG emissions," Panasonic "Superior Green Products," Kimberly-Clark "ecoLOGICAL," Johnson & Johnson "Earthwards®," and Allianz "Green Solutions." For full source information, please see "Revenue Data" in the Appendix.

For example, Toshiba’s environmentally conscious products (ECPs) are designed to minimize environmental impact throughout all stages of their life cycle, including procurement of materials, manufacture, distribution, use, disposal, and recycling. Similarly, Kimberly-Clark’s ecoLOGICAL portfolio makes use of life cycle assessment (LCA) tools for product development and product scorecards. (LCA is a technique to assess environmental impact of a product including all of its “life” stages from raw material extraction, energy and emissions from manufacturing, to final disposal or recycling.) Johnson & Johnson first introduced Earthwards® as a proprietary process for analyzing product life cycles to guide the development of the Earthwards® product portfolio. It incorporates LCA in the design process to implement sustainability improvements to the company’s products.

Not all companies believe in tracking revenues from sustainable products separately, and very few companies track sustainability-specific R&D spending Some companies intentionally make no distinction between sustainable and non-sustainable products, and therefore do not track revenues from these products separately. This is particularly true in the case of R&D spending, as many companies do not track sustainability R&D separately, believing that sustainability considerations are applied throughout the product development process. IBM, for example, chooses not to break out sales from sustainable products as the company’s approach is to integrate environmental sustainability across its products and services.

Among the few companies in our sample that track sustainability-specific R&D, on average about two-fifths of R&D spending is allocated to sustainability, and these investments have yielded positive results For example, in 2010 GE allocated about 46 percent of its R&D budget to the company’s EcomaginationSM initiative. By 2014, EcomaginationSM accounted for 31 percent of GE’s industrial revenues, an 89 percent increase in EcomaginationSM revenue compared to 2010.

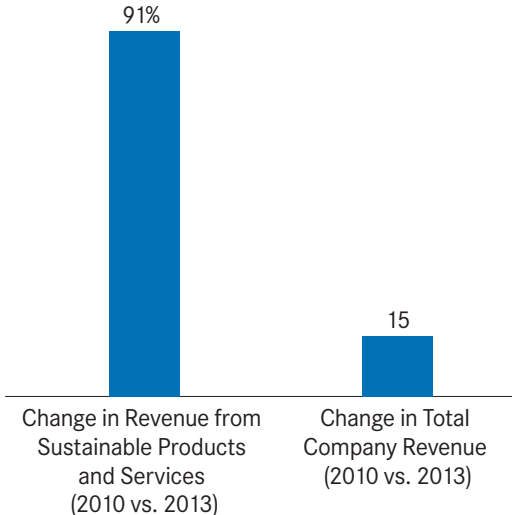
Table 1.2
Change in Revenue from Sustainable Products and Services vs. Change in Total Company Revenue (2010 vs. 2013)*

Company (Industry)	Change in Revenue from Sustainable Products and Services (2010 vs. 2013)	Change in Total Company Revenue (2010 vs. 2013)
GE (Industrials)	72%	22%
Philips (Industrials)	60	14
Siemens (Industrials)	19	13
BASF (Chemicals)	-13	16
Dow Chemical (Chemicals)	147	6
DuPont (Chemicals)	56	29
Kimberly-Clark (Household products)	296	7
AVERAGE	91%	15%

*Figures only listed for companies with data available back to 2010.

Chart 1.2
Change in Revenue from Sustainable Products and Services vs. Change in Total Company Revenue (AVERAGE, 2010 vs. 2013)

Revenue growth from sustainable products and services has significantly outpaced overall revenue growth in our sample



Sources: Figures were calculated by The Conference Board with data from the following company-defined portfolios: GE “EcomaginationSM,” Philips “Green Products,” Siemens “Environmental Portfolio, BASF “climate protection products,” Dow Chemical “products highly advantaged by sustainable chemistry,” DuPont “products that reduce GHG emissions,” and Kimberly-Clark “ecoLOGICAL.” For full source information, please see “Revenue Data” in the Appendix.

Similarly, Philips allocated almost one-quarter of R&D to “green innovation” in 2010, and in 2014, revenue from the Philips “Green Products” portfolio accounted for more than half of the company’s total revenues—a 60 percent increase compared to 2010. Since 2011, Nissan has allocated about 70 percent of R&D to environmental technologies, and the company doubled its sales of Nissan Leaf (all-electric) vehicles between 2011 and 2013.

When asked about the primary drivers for launching sustainable product initiatives, companies point to customer demand for solutions that address global sustainability challenges, such as climate change and resource scarcity Launching these initiatives

requires overcoming a number of significant challenges, such as a lack of existing global standards in this field; challenges associated with the trade-offs between cost, environmental design, and pressure to price sustainable products competitively; and challenges embedding these initiatives into existing company processes.

To successfully launch sustainable product initiatives, engage stakeholders This includes getting CEO buy-in, tapping into motivated and passionate employees, understanding the specific needs of customers and society, and clearly communicating the business benefits of the company’s sustainable products.

Research shows that commercial and investment banks are playing an increasingly significant role in financing the development of large-scale sustainable products and solutions, primarily through asset finance, tax equity, and green bonds Total investments in clean energy, for example, increased 142 percent from 2006, reaching US\$310 billion in 2014.² Renewable energy asset finance accounts for the greatest share of total clean energy investments, totaling US\$184 billion in 2014—a 16 percent increase from 2013. Estimates from Bloomberg New Energy Finance (BNEF) show investments in clean energy may reach US\$630 billion by 2030, signaling a significant opportunity for financial institutions to enable the development of innovative environmental technologies.

² *Global Trends in Clean Energy Investment*, Bloomberg New Energy Finance, January 9, 2015, p. 3, <http://about.bnef.com/presentations/clean-energy-investment-q4-2014-fact-pack/content/uploads/sites/4/2015/01/Q4-investment-fact-pack.pdf>.

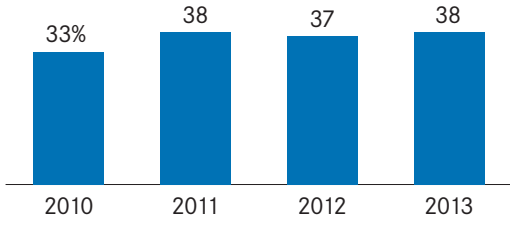
Table 1.3
Sustainability R&D Spending as a Percentage of Total R&D Spending

Company (Industry)	2010	2011	2012	2013	2014
GE (Industrials)	46%	50%	38%	39%	54%
Philips (Industrials)	22	24	26	24	28
Siemens (Industrials)	n/a	26	35	n/a	n/a
Toshiba (Industrials)	5	7	5	7	n/a
BASF (Chemicals)	33	33	33	33	n/a
DuPont (Chemicals)	40	42	41	46	n/a
Daimler (Automobiles)	50	50	50	50	n/a
Nissan (Automobiles)	n/a	70	70	70	n/a
AVERAGE	33%	38%	37%	38%	41%

Notes: “n/a” for figures from 2010 to 2013 indicates data were not tracked at that time. For 2014, “n/a” indicates figures were not available at time of publication but may be forthcoming. Data for 2014 are shown in the table for reference but not depicted in aggregate in charts or included in our analysis.

Chart 1.3
Sustainability R&D Spending as a Percentage of Total R&D Spending (AVERAGE)

Companies in the sample allocated 38 percent of R&D to sustainability in 2013, up from 33 percent in 2010



Sources: Figures were calculated by The Conference Board from data disclosed by companies related to the following portfolios or technologies: GE “Ecomagination™,” Philips “Green Innovation,” Siemens “Environmental Portfolio,” Toshiba “Excellent ECPs,” BASF “product and process innovations where the R&D target is related to resource efficiency and climate protection,” DuPont “environmental R&D investment for new product development (excludes investment devoted to process improvements),” Daimler “green technologies R&D,” and Nissan “environmental technologies R&D.” For full source information, please see “R&D Data” in the Appendix.

Methodology

While data on revenue generated by sustainable products and services are becoming more widely available, this information remains relatively limited; ultimately, revenue data were found for only 12 of the 100 companies in our research universe (companies listed on the S&P Global 100 Index as of October 21, 2014). For the four automobile companies included in our sample, data for unit sales of alternative fuel vehicles were analyzed instead of revenue and are shown separately. Available data for sustainability-specific R&D investment were even more limited: these figures were obtained for only 8 of the 100 companies. As such, the final results and findings presented in this report should be interpreted accordingly and with caution.

The combined revenue of these select companies totaled more than US\$1 trillion in 2014. Given their size and scope, the findings from our analysis remain significant and relevant and provide strong evidence that leading companies are pursuing sustainable products and services as a business strategy.

Research Process

The first stage of the research process involved obtaining, organizing, and analyzing publicly disclosed company data on revenue and R&D spending related to sustainable products and services. Data were collected from various sources, including company annual reports, sustainability/CSR reports, corporate websites, responses to existing surveys/frameworks (e.g., CDP), ESG databases (e.g., Bloomberg), and other verifiable secondary sources. Data were collected for the most recent year available and for each year back to 2010 (when available) to document changes over time. All companies in the research universe were contacted to obtain revenue and R&D data for sustainable products and services. In many instances, data were not available (see “Research Limitations” p. 12.)

Defining what constitutes a sustainable product or service was critical to this stage of the research. Sector-specific definitions were used, to closely reflect the ways corporations have been pursuing innovation in their specific industries. To inform the choice of the right set of

industry-specific definitions, existing materiality frameworks (which help identify the most significant ESG issues for each industry) were reviewed (e.g. frameworks from the Sustainability Accounting Standards Board (SASB), Global Reporting Initiative (GRI), and CDP) and input was obtained from corporate executives and industry association representatives. For more detail on the specific definitions used, see “Defining Sustainable Products” on page 11.

For data on R&D spending allocated to sustainability, the research focused broadly on companies that track and disclose R&D figures related to sustainability or environmental initiatives. While in some instances these R&D figures are explicitly linked to developing a company’s sustainable products portfolio, this is not the case in all examples featured in this report. Generally, figures on R&D spending on sustainability apply broadly to a company’s sustainability initiatives and are not necessarily limited to the sustainable product portfolios discussed in this report.

Companies for which relevant data were found are in some cases grouped by industry or sector for the purpose of comparative analysis. Not all industries and sectors are equally represented, and in some cases no data were available for entire industries (e.g., food and beverage, energy, and utilities).

The revenue and R&D findings section of this report includes the following figures for featured companies:

- Revenue from sustainable products for the latest year available and historically (to 2010 as available)
- Revenue from sustainable products as a percentage of total company revenue
- Change in revenue from sustainable products (between available years)
- R&D spending allocated to sustainability
- R&D spending allocated to sustainability as a percentage of total company R&D spending
- Change in R&D spending allocated to sustainability

- Commentary on the demand for sustainable products and services across the various industries represented by companies featured in this report.

Sustainable product revenue and R&D figures for 2014 are shown in tables when available. However, the charts and analysis in this report focus on 2013 figures since this is the most recent year with complete data for companies in the sample.

A separate section discusses the role of the financial sector in driving growth of sustainable products and services. Specifically, this section broadly examines the activities of S&P Global 100 companies related to sustainability-themed lending and project finance (such as renewable energy asset finance and green bonds), as these represent some of the primary ways financial institutions can help clients invest in advanced environmental technologies.

Table 1.4 **Data Sample**

Data on revenue and/or R&D related to sustainable products and services were obtained for the companies below

Industry	Company	Revenue Data	R&D Data
Chemicals	BASF	●	●
Chemicals	Dow Chemical	●	
Chemicals	DuPont	●	●
Pharmaceuticals	Johnson & Johnson	●	
Household products	Kimberly-Clark	●	
Industrials	Caterpillar	●	
Industrials	GE	●	●
Industrials	Philips	●	●
Industrials	Siemens	●	●
Industrials	Toshiba	●	●
Insurance	Allianz	●	
Household durables	Panasonic	●	

For automobile companies, unit sales of alternative fuel vehicles and R&D related to environmental technology were obtained for the companies below

		Sales Data	R&D Data
Automobiles	Daimler		●
Automobiles	Ford	●	
Automobiles	Honda	●	
Automobiles	Nissan	●	●
Automobiles	Toyota	●	

Figures in this report are shown in US dollars (with the exception of some figures in the company profiles). In several instances company revenue and R&D figures have been converted from original currencies. These conversions are based on yearly average exchange rates of the Internal Revenue Service.

The second stage of the research consisted of identifying companies to be featured in company profiles (beginning on page 40). These companies generally have portfolios of sustainable products and track revenues from these portfolios or have otherwise shown to be at the forefront of sustainability innovation. The companies featured in the profiles recognize the positive impact sustainability initiatives can have on driving topline growth. The profiles elaborate on the companies' initiatives related to sustainability revenue generation (e.g., highlighting key product examples) and relevant sustainability R&D investments (e.g., centers dedicated to sustainability research or specific areas of research). The profiles were developed with input from executives from the companies featured and offer qualitative insights in addition to the quantitative analysis.

Table 1.5

Yearly Average Currency Exchange Rates

This report uses the following exchange rates for converting currencies into US dollars

Year	Euro	Yen
2014	0.784	110.101
2013	0.783	101.517
2012	0.809	83.008
2011	0.748	82.931
2010	0.785	91.342

Source: US Internal Revenue Service, <http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates>.

Defining Sustainable Products

This report acknowledges that the term “sustainable product” is riddled with definitional issues: the term can be confusing, flawed, and even misleading. It can be argued that truly sustainable products do not exist (all products have some environmental impact), and in fact this is the view taken by many of the companies featured in this report. Instead, many companies prefer to use terms that describe their products as being environmentally superior to existing alternatives, using terms such as “sustainability-advantaged” or “environmentally-preferable,” among others.

This report uses the term “sustainable products” simply as short-hand to refer to products or services that have an explicit environmental advantage over equivalent existing products or services. The use of this term in the commentary throughout this report should not be interpreted as an acceptance of this term by the companies featured in this report.

Table 1.6
Existing Definitions of Sustainable Products

The following table provides a few examples of how various organizations define sustainable products, environmentally preferable products, and the environmental goods and services industry. These definitions have helped inform the definitions used throughout this report.

Organization	Definition
Lowell Center for Sustainable Production (University of Massachusetts Lowell)	<p>Sustainable products refer to products which:</p> <ul style="list-style-type: none"> • Minimize environmental and social costs throughout the product life cycle • Maximize environmental and social benefits to communities • Remain economically viable
Organisation for Economic Co-operation and Development (OECD)	<p>The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use.</p>
Asia-Pacific Economic Cooperation (APEC)	<p>Environmental goods and services is an industry sector devoted to solving, limiting or preventing environmental problems.</p>
United Nations Conference on Trade and Development (UNCTAD)	<p>Environmentally preferable products refer to products which cause significantly less environmental harm at some stage of their life cycle (production, processing, consumption, [or] waste disposal) than alternative products that serve the same purpose, or products, the production and sales of which contribute significantly to the preservation of the environment.</p>

Sources: Lowell Center for Sustainable Production, University of Massachusetts Lowell, <http://www.sustainableproduction.org/proj.SustainableProductsInitiative.php> and “Trade in Environmental Goods and Services: Opportunities and Challenges,” International Trade Centre, 2014, p. 5, <http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/AssetPDF/EGS%20Ecosystems%20Brief%20040914%20-%20low%20res.pdf>.

This report starts with a base-level definition of sustainable products as products or services that have an explicit environmental advantage over equivalent existing products or services. Many of the companies featured in this report have developed sustainable product portfolios based loosely on this definition (or a variation of this definition), and the findings in this report are largely based on company data associated with these portfolios. However, there are important exceptions in which more specific definitions better account for differences in business models and industries. These specific definitions are described in the table that follows:

Table 1.7
Industry-specific Definitions Used in This Report for Sustainable Products and Services

Industries	Definitions used for sustainable products / services
All	Products or services that have an explicit environmental advantage over equivalent existing products or services, or products that create environmental efficiencies or introduce significant environmental innovations.
Automobiles	Alternative fuel vehicles, including hybrid and electric vehicles (note: unit sales figures, rather than revenue, were used for this industry). For the purpose of this analysis, does not include other products and services such as charging stations, smart mobility, and vehicle lightweighting.
Commercial Banks	Sustainability themed lending and project finance (such as carbon finance, clean tech financing, green bonds, and green loans). For the purpose of this analysis, does not include microfinance or socially responsible investments (SRI).
Insurance	Insurance products related to energy and resource efficiency, insurance products for low-carbon and renewable energy technologies, and investments in renewable energy. For the purpose of this analysis, does not include microinsurance or socially responsible investments (SRI).

Research Limitations

Not all industries are represented in this report for two reasons: the scope of this research does not lend itself equally well to companies in all industries, and relevant data could not be obtained (either through public sources or directly from companies). The absence of certain industries from this report should not be interpreted as an absence of sustainable products and services in those industries. On the contrary, many companies in these industries have sustainable product offerings. At the time of this research, the quantifiable data relating to these product offerings were not available or could not be confirmed.

For practical reasons, the analysis in this report does not include the full spectrum of a company’s sustainable products in some cases. For example, for automobile companies, this report defines sustainable products as alternative fuel vehicles and does not include revenue from other products or services these companies may offer, such as smart vehicle components, electric vehicle charging stations, and batteries.

Many of the charts and tables in this report show both absolute values (e.g. revenue from sustainable products) and ratios (e.g. percentage of total revenue from sustainable products). While an attempt has been made to make the data comparable across companies, variations in company-level definitions limit the comparability of absolute values. For this reason, greater emphasis should be placed on the ratios and growth trends rather than absolute values.

While all companies in the research universe were contacted for the purposes of verifying the accuracy of data collected and obtaining additional data, not all companies responded. Data were verified directly with a senior company executive for 12 of the 16 companies included in the research. When data were not verified with company executives, every effort was made to ensure the data were obtained from reliable sources (e.g. annual reports or sustainability reports), and these sources are noted in the appendix.

While data on revenue generated by sustainable products are becoming more widely available, this information remains relatively limited. Of the 16 companies for which sustainable product revenue data are available, four are automobile companies. For these companies, the analysis uses unit sales of alternative fuel vehicles instead of revenue figures. Data on R&D investment specifically related to sustainability are even more limited: these figures were only obtained for eight of the 100 companies.

Given the size and scope of the companies in our sample, we believe our findings and analysis are significant and relevant. For instance, these 16 companies represent seven sectors and eight industries, and have an average market cap of over US\$90 billion and a combined market cap of almost US\$1.5 trillion.³ In 2014 the average revenue of companies in this sample was over US\$80 billion, and the combined revenues totaled more than US\$1 trillion.

³ As of April 10, 2015.

Sustainable Products and Services: Revenue and R&D Findings

OVERVIEW OF COMPANY PORTFOLIOS

Our review of the S&P Global 100 found a number of examples of companies with quantifiable portfolios of sustainable products and services. In the following pages we feature revenue data for 12 companies, alternative fuel vehicle sales data for four automobile companies, and sustainability R&D data for eight companies. The companies featured span seven sectors and eight industries, including automobiles, chemicals, consumer staples, industrials, and insurance.

Many of the companies featured in this report are not newcomers to corporate sustainability. Strong foundations are needed to successfully launch and grow portfolios of sustainable products and services, and these companies have been active participants in developing and refining their sustainability strategies and initiatives over the past several years. In fact, the majority of companies featured in this report have robust corporate sustainability programs—more than half are included in the Dow Jones Sustainability Index (DJSI) and over three-fourths are signatories to the UN Global Compact.

Portfolios of sustainable products exist across a variety of industries—from chemicals to insurance—driven by growing customer demand for products with environmental benefits.

Many of the companies in our sample have branded portfolios of sustainable products, such as GE's EcomaginationSM portfolio or Kimberly-Clark's ecoLOGICAL portfolio. Revenue figures from these portfolios are in some cases reported in the companies' sustainability reports or equivalent corporate communications. Other companies track these revenues internally but do not necessarily report them in sustainability or annual reports, as does Caterpillar.

The composition of these portfolios varies by industry as well as by company, although there are some commonalities between companies in similar sectors or industries. Following is an overview of these portfolios of sustainable products and services and the context driving customer demand for them.

CHEMICALS

Among the chemical companies in our sample, portfolios generally include products with an environmental profile superior to the products they replace or products that introduce environmental benefits (e.g. products that help reduce emissions). **Dow Chemical** (see company profile on page 52), for instance, tracks sales of products that are “highly advantaged by sustainable chemistry,” which include products that improve energy efficiency and reduce waste, among other benefits. In the case of **DuPont** (see page 56), the company tracks sales of products that increase energy efficiency or significantly reduce GHG emissions. Similarly, **BASF's** (see page 44) portfolio of “climate protection products” focuses on products that enable energy efficiency and reduce GHGs.

“It is critical to have broad, extensive stakeholder input before beginning any sustainability program, as this input can help identify key opportunities. Focusing on these relevant, meaningful opportunities can help an organization deliver real improvement for itself and its stakeholders.”

Anne Wallin, Director of Sustainable Chemistry, Dow Chemical

DEMAND FOR SUSTAINABLE PRODUCTS IN THE CHEMICALS INDUSTRY

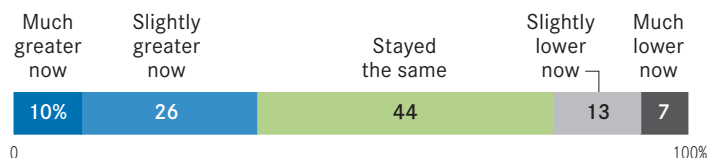
Chemical companies are finding considerable demand for products with environmental benefits, particularly as customers (such as consumer goods companies) increasingly seek products that can help them reduce their own environmental footprint and the footprint of their supply chain. Chemical companies are introducing innovations that both improve the environmental profile of existing products and develop new products. This includes developing products with safer chemicals, as well as increasing the use of recycled, bio-based, and/or renewable materials.

Results from a 2014 survey found that 62 percent of respondents from chemical producers indicated their customers have expressed an interest in sustainable chemicals. Furthermore, 36 percent of respondents said the level of interest amongst customers in sustainably produced chemicals had increased over the past year, with 10 percent saying it is now much greater.⁴ The same survey also found that 72 percent of producers now offer more sustainable versions of chemicals or plan to offer them in the next 1–2 years and that 75 percent of chemical users have either started to offer products made with more sustainable chemicals or expect to do so within two years.

What is your top business priority in terms of sustainability?



In the last year, how has the level of interest from customers in sustainably produced chemicals changed?



Source: "Sustainability Plans Take Hold in the Mainstream," Geomatica, p. 44, http://www.genomatica.com/_uploads/Sustainability-plans-take-hold-in-the-mainstream.pdf.

⁴ *Sustainability plans take hold in the mainstream*, ICIS Chemical Business, September 8-14, 2014, http://www.genomatica.com/_uploads/Sustainability-plans-take-hold-in-the-mainstream.pdf.

Examples of the types of sustainability-advantaged products marketed by chemical companies include the following:⁵

- Enzymes that help reduce food waste
- Metallization pastes used in solar panels to improve the conversion efficiency of crystalline solar cells
- Cellulosic ethanol, which helps make biofuels more sustainable by avoiding the use of food crops for ethanol production
- Fuel additives that help reduce fuel consumption, premature engine wear, and pollutant emissions
- Decomposition catalysts that help reduce nitrous oxide emissions by converting nitrous oxide into harmless nitrogen and oxygen
- Reverse osmosis membranes that can deliver improved water purification by using less energy
- Structural adhesives which help “lightweight” or reduce the weight of vehicles by bonding dissimilar materials such as metal and plastic and can contribute to GHG avoidance and gasoline savings

Green Chemistry

The 12 Principles of Green Chemistry
A framework for designing or improving materials, products, processes, and systems.

- 1 Prevent waste
- 2 Atom economy
- 3 Less hazardous synthesis
- 4 Design benign chemicals
- 5 Benign solvents and auxiliaries
- 6 Design for energy efficiency
- 7 Use of renewable feedstocks
- 8 Reduce derivatives
- 9 Catalysis (vs. stoichiometric)
- 10 Design for degradation
- 11 Real-time analysis for pollution prevention
- 12 Inherently benign chemistry for accident prevention

Source: “The 12 Principles of Green Chemistry,” ACS Green Chemistry Institute®, 2014, <http://www.acs.org/content/dam/acsorg/greenchemistry/resources/the-12-principles-of-green-chemistry-pocket-guide.pdf>.

⁵ Industry examples come from company profiles submitted to The Conference Board, pages 40–89.

PHARMACEUTICALS AND HOUSEHOLD PRODUCTS

Johnson & Johnson (see page 69) and Kimberly-Clark (see page 72) both have portfolios of products selected according to environmental criteria. For example, Johnson & Johnson's Earthwards® portfolio includes products that achieve significant improvements in at least three out of the following seven sustainability areas: sustainability in

materials, packaging, energy, waste, water, social impact, or innovation. Kimberly-Clark's ecoLOGICAL portfolio includes products that must be evaluated and qualified in at least one of the following four categories: responsible materials, life cycle footprint, third-party recognition, or breakthrough environmental innovation.

Consumer demand for sustainable products is growing

While the specifics of consumer demand for sustainable products continue to be debated, consumers increasingly care about where the products they purchase come from, what goes into them, and how they are made. Consumers also seem to be willing to pay more for products with sustainability advantages: a 2014 global Nielsen survey found that 55 percent of online consumers indicated they were willing to pay more for products and services provided by companies that are committed to positive social and environmental impact, an increase from 50 percent in 2012 and 45 percent in 2011.⁶ The Sixth Annual Tork Green Business Survey found in 2014 that 75 percent of American adults reported purchasing green products and services, up from 69 percent in 2012. In 2014, 54 percent of consumers made these purchases for environmental reasons, up from 48 percent in 2012. The Tork Green Business survey also found that in the US, 40 percent of adults are willing to pay more for products if ethical and responsible manufacturing practices are guaranteed. Trends among younger consumers may strengthen demand even further in the future: the survey found that 56 percent of millennials (ages 18–34) are willing to pay more for these products, compared to only 34 percent of consumers aged 35 and older.⁷

Consumer interest in sustainable products is evident across several industries within the consumer staples sector. For example, the global market for organic personal care—one of several product segments in this sector—is expected to almost double by 2020, from US\$8.2 billion in 2013 to almost US\$16 billion.⁸ Demand for environmentally-friendly personal care products is expected to grow, in part due to consumers becoming increasingly selective about the chemical content of the products they use.

Large retailers, such as Walmart and Target, are also seeing evidence of demand for more sustainable products. According to Target, the company's sales in natural and organic products are growing at a rate of about 15 to 20 percent. Growth in this product segment led Target to launch "Made to Matter" in 2014, an initiative showcasing a selection of the company's "handpicked natural, organic, and sustainable" products.⁹ Walmart recently launched a similar initiative, its "Sustainability Leaders" website, which offers a portal for consumers to shop for products from companies that lead on Walmart's Sustainability Index, the retailer's scorecard for rating suppliers on environmental and social criteria.

6 *Doing Well by Doing Good*, The Nielsen Company, June 2014, p. 5.

7 "Millennial Consumers Lead Growth in Green Purchasing," Sixth Annual Tork Green Business Survey, July 14, 2014, <http://www.torkusa.com/Resources/news/News/2014-Tork-Green-Business-Survey-US/> and SCA's Tork Green Business Survey, June 5, 2012, <http://betterbusiness.torkusa.com/green-business-survey-tork-bbc/>.

8 "Global Organic Personal Care Market By Product (Skin Care, Hair Care, Oral Care, Cosmetics) Expected To Reach USD 15.98 Billion By 2020," *Grand View Research*, press release, July 2014, <http://www.grandviewresearch.com/press-release/global-organic-personal-care-market>.

9 "Target Makes Big Push Into Natural, Organic Market (Whole Foods' Sweet Spot) With 'Made To Matter,'" *Forbes*, April 9, 2014, <http://www.forbes.com/sites/barbarathau/2014/04/09/target-makes-big-push-into-natural-organic-market-whole-foods-sweet-spot-with-made-to-matter/>.

INDUSTRIALS AND HOUSEHOLD DURABLES

Sustainable product portfolios among the industrial and household durables companies in our sample generally consist of products with environmental profiles superior to older generation products (often measured in terms of energy efficiency) or products that introduce significant environmental innovations.

Siemens (see page 80), for example, has an “environmental portfolio” that focuses on products and services that contribute to environmental and climate protection. Inclusion in this portfolio is primarily based on criteria related to energy efficiency (e.g., products that offer improvements in energy efficiency over comparable products); renewable energy (e.g., wind turbines or smart grid applications); and environmental technologies (e.g., pollution control and water treatment systems).

Philips (see page 76) has a portfolio of “green products” which offer a significant environmental improvement in one or more of the following areas: energy efficiency, packaging, hazardous substances, weight, recycling and disposal, and lifetime reliability.

Toshiba meanwhile, (see page 85) has a portfolio of “environmentally conscious products” (ECPs) designed to have minimum environmental impact during their entire life cycle. Toshiba reviews products for the portfolio based on three elements: mitigation of climate change (e.g., energy usage and efficiency); efficient use of resources (e.g., reduced raw material usage); and management of chemicals (e.g., reduced usage of hazardous substances). Toshiba further segments products as “excellent ECPs,” i.e., products which the company considers to have some of the highest level of environmental performance in the industry.

Panasonic has a portfolio of “strategic green products,” which includes products and services that reduce environmental impact with top-level environmental performance in the industry (e.g., energy or water saving products); products and services whose promotion and dissemination lead to reducing environmental impact (e.g., recyclable or energy-creating products, energy-storing products, and energy management systems); and products and services that reduce environmental impact on a specific region or support measures to address environmental impact (e.g., air filtration devices, water filters, environmental engineering services, and the like).

“...In EcomaginationSM we launched a big new growth initiative that has not only benefited our own operations and footprint, but has had significant positive impact for our customers and the communities they operate in as well.”

Deb Frodl, Global Executive Director, EcomaginationSM, GE

Caterpillar (see page 48) tracks revenue from products that offer a clear sustainability advantage over the products that they replace, such as products from the company’s remanufacturing business, power generation systems that offer combined heat and power configurations, and systems that utilize alternative fuels such as landfill gas and biogas, as well as breakthrough technology such as hydraulic hybrids and diesel/electric drives.

GE’s (see page 60) EcomaginationSM initiative represents the company’s commitment to technology solutions that improve business performance and manage environmental impact for both its customers as well as GE’s own operations. The initiative was launched in 2005 and includes a diverse range of products and solutions, from wind turbines for utility-scale power generation to energy efficient jet engines and LED lighting systems.

DEMAND FOR SUSTAINABLE PRODUCTS AND SERVICES IN THE INDUSTRIALS SECTOR

Industrials play an important role in enabling their customers to achieve their own environmental sustainability goals by developing products that address environmental concerns. Global demand for energy, for example, is expected to increase 37 percent by 2030, creating a strong market for products and solutions that help businesses meet rising energy needs—or reduce them—in ways that are cost-efficient and environmentally sustainable.¹⁰ As more companies set energy and emissions reduction goals, products that help meet these goals become increasingly attractive. Global spending on industrial energy management systems and services, for example, is expected to double from US\$11.3 billion in 2013 to US\$22.5 billion in 2020.¹¹ While this market has traditionally been led by large industrials, information technology companies are also expected to play an increasing role as data and business analytics drive environmental programs.

Water is also an important focus for companies in this sector. A 2014 UN report estimates global demand for water will increase by about 55 percent by 2050, driven primarily by growing demands from manufacturing and thermal electricity generation.¹² These and other natural resource challenges highlight the need and opportunity for industrials to develop products that integrate environmental criteria to better meet emerging customer demands.

Some examples of the types of sustainable products marketed by industrials include:¹³

- Ultrasound platforms that reduce energy use and product weight as compared to alternatives;
- Circuit breakers developed to be free of hazardous materials;
- Drive technologies that cut energy consumption relative to alternatives;
- Power generation systems that are fueled by alternative energy sources;
- LED traffic and rail signals;
- Hydraulic hybrid excavators that deliver fuel efficiency over conventional models;
- Motors for hybrid electric vehicles;
- Batteries for electric vehicles; and
- Renewable energy technologies, such as wind turbines.

10 *World Energy Outlook 2014 Executive Summary*, International Energy Agency, p. 1, <http://www.iea.org/Textbase/npsum/WEO2014SUM.pdf>.

11 “Industrial Energy Management Systems Will Reach \$22.5 Billion in Annual Revenue by 2020,” Navigant Research, press release, April 15, 2013, <http://www.navigantresearch.com/newsroom/industrial-energy-management-systems-will-reach-22-5-billion-in-annual-revenue-by-2020>.

12 *World Water Development Report 2014*, United Nations Educational, Scientific, and Cultural Organization, 2014, p. 2, <http://unesdoc.unesco.org/images/0022/002257/225741E.pdf>.

13 Industry examples come from company profiles submitted to The Conference Board, pages 40–89.

TECHNOLOGY

Companies in this sector provide technologies and solutions that help manage energy usage, reduce material consumption, and enable customers to realize other efficiencies in their own operations. For example, smart grids and smart meter technology can help companies manage energy costs more efficiently and reduce associated carbon emissions. Products and solutions offered by technology companies can enable entire industries and municipalities to become more resource efficient. Estimates show that information and communication technology (ICT)-enabled solutions could contribute to a reduction in annual GHG emissions by 16.5 percent by 2020.¹⁴

Demand for technologies that help improve efficiencies and energy analytics are expected to grow, driven by factors such as regulatory requirements, a growing need to interconnect renewable energy sources (such as offshore or remote wind and solar farms), and the proliferation of smart devices in the energy grid. Global revenue from smart grid technology, for example, is projected to grow by almost 60 percent, from US\$44.1 billion in 2014 to US\$70.2 billion in 2023.¹⁵ Demand for smart and connected devices is also expected to grow among consumers. Estimates from a 2014 report indicate there will be over 10 million connected appliances in “smart homes” by 2017, a 150 percent increase from the 4 million at the end of 2013.¹⁶ Meanwhile, the global smart home and buildings market is projected to grow from US\$4.8 billion in revenue in 2012 to US\$35.3 billion by 2020.¹⁷

Examples of the types of sustainability-advantaged products in the technology sector include:

- Server memory designed to reduce energy consumption;
- Server management technology to optimize and manage power, cooling, and compute resources in data centers;
- Printers that help conserve energy through automatic on/off technology or that can be shut down remotely and at predetermined times;
- Electronic devices made with bio-based and/or recycled plastics;
- Utility solutions that help manage energy supply and demand;
- Software solutions to help manage resource consumption, such as water usage in agribusiness;
- Energy-efficient large-screen projectors;
- Ultra-light and 100 percent recyclable notebook computers;
- Smart air conditioners that automatically manage cooling speed, temperature, and power usage; and
- Traffic and congestion management solutions.

14 *GeSI SMARTer2020: The Role of ICT in Driving a Sustainable Future*, Global e-Sustainability Initiative, 2012, p. 9, <http://gesi.org/portfolio/report/72>.

15 “Revenue from Smart Grid Technologies is Expected to Reach \$70.2 Billion Annually by 2023,” Navigant Research, press release, November 17, 2014, <https://www.navigantresearch.com/newsroom/revenue-from-smart-grid-technologies-is-expected-to-reach-70-2-billion-annually-by-2023>.

16 “Smart Home Connected Appliances to exceed 10 Million Installed by 2017, Juniper Research Finds,” Juniper Research, press release, April 15, 2014, <http://www.juniperresearch.com/viewpressrelease.php?pr=438>.

17 “Global Smart Homes and Buildings Market to Reach \$35.3 Billion by 2020,” Allied Market Research, press release, January 22, 2014, <http://www.prnewswire.com/news-releases/global-smart-homes-and-buildings-market-to-reach-353-billion-by-2020---allied-market-research-241444771.html>.

A report by the Global e-Sustainability Initiative and The Boston Consulting Group identifies “change-levers,” specific technologies or groups of technologies that

use ICT to reduce GHG emissions. The following table summarizes the four change-levers and provides relevant product and service examples:

Description of change-levers		
Change-lever	Description	Examples
Digitilization and dematerialization	Substituting or eliminating the need for an emissions-intensive product, material, process, or service. Also the reuse/multiple use of information sources, media, etc. via ICT.	Videoconferencing, telecommuting, e-commerce
Data collection and communication	Providing real-time data and analysis that allows for better decision making , identifies a need for change , or encourages more efficient behaviors .	Demand management, eco-driving, weather forecasting, building audit and benchmarking
System integration	Managing the use of resources and integrating lower-emissions intensive processes.	Virtual power plant, building management system, renewables integration
Process, activity, and functional optimization	Intelligent simulation, automation, redesign, or control to optimize a process, activity, function, or service.	Reduction of transmission and distribution losses, centralized distribution centers, building design

Source: GeSI SMARTer 2020: The Role of ICT in Driving a Sustainable Future, Global e-Sustainability Initiative and the Boston Consulting Group, p. 29, (http://gesi.org/assets/js/lib/tinymce/jscripts/tiny_mce/plugins/ajaxfilemanager/uploaded/SMARTer%202020%20-%20The%20Role%20of%20ICT%20in%20Driving%20a%20Sustainable%20Future%20-%20December%202020%2012.pdf).

INSURANCE

The insurance company included in our sample, Allianz (see page 41), offers sustainable or “green” insurance products that can take several forms and can be marketed to both consumers as well as commercial customers. For example, policies with lower premiums for owners of alternative fuel vehicles can help incentivize adoption of these vehicles. Similarly, some policies designed for homeowners can incentivize green building standards and the purchase of energy efficient appliances. For commercial and industrial customers, policies can be designed to include coverage for renewable energy infrastructure, such as offshore wind and solar panels, and can also provide performance assurance and related warranties.

EXAMPLES OF SUSTAINABLE/GREEN INSURANCE PRODUCTS

Through innovative products and services, such as those designed to drive energy efficiency and minimize resource consumption, insurance companies can incentivize individuals and businesses to adopt more sustainable practices. The financial resources of companies in this industry can also be significant catalysts for new environmental technologies.

A recent article by Deloitte provides a good overview of the various types of sustainable products that may be offered by insurance companies

A few examples of these products include the following:¹⁸

Personal lines

- Green property rebuilding
- Property renewable energy reimbursement
- Property loss mitigation device discount
- Pay as you drive / low mileage discount
- Fuel efficient / low emission vehicle discount

Commercial lines

- Upgrade to green commercial fleets
- Insurance for renewable energy projects
- Insurance for renewable energy property, equipment, and loss of use
- Insurance for green building
- Energy savings insurance
- Insurance for carbon capture and storage / emission reduction projects
- Green building coverage against adverse publicity
- Perishable food reduction products
- Global weather insurance
- Political risk insurance for carbon trading

Specialty lines

- Insurance for pollution/environmental liability
- Directors and officers insurance
- Architects and engineering professional liability insurance discount for building commissioning
- Professional liability insurance for raters and home energy survey professionals

¹⁸ Rita Zona, Kevin Roll, and Zora Law, “Sustainable/Green Insurance Products,” Casualty Actuarial Society E-Forum, Winter 2014, https://www.casact.org/pubs/forum/14wforum/Zona_Roll_Law.pdf.

Avoiding Misleading Environmental Claims: The US Federal Trade Commission’s “Green Guides”

How companies market sustainable products to customers and consumers is an important issue. On the one hand, promoting the knowledge and use of environmentally preferable products can have positive outcomes for producers, consumers, and the environment. For example, ultra-efficient light bulbs offer opportunities on several fronts: a new growth segment for producers, lower long-term energy costs for consumers, and reduction of GHG emissions due to more efficient energy usage. However, instances of product “greenwashing” (e.g. making unsubstantiated, overstated, or misleading claims about a product’s environmental benefits) are detrimental to legitimate efforts to improve the environmental profile of products.

In the United States, the Federal Trade Commission has issued “Green Guides” since 1992 to help marketers avoid making misleading environmental claims. The Guides have been updated a number of times, most recently in 2012, and provide general principles broadly applicable to all environmental marketing claims as well as guidance on specific environmental claims. For example, the Guides caution marketers against making broad, unqualified claims that a product is “environmentally friendly” or “eco-friendly” because such claims may suggest a product has far-reaching environmental benefits. The following is an excerpt from section 260.4 (General Environmental Benefit Claims) from the Guides:

(a) It is deceptive to misrepresent, directly or by implication, that a product, package, or service offers a general environmental benefit.

- (b) Unqualified general environmental benefit claims are difficult to interpret and likely convey a wide range of meanings. In many cases, such claims likely convey that the product, package, or service has specific and far-reaching environmental benefits and may convey that the item or service has no negative environmental impact. Because it is highly unlikely that marketers can substantiate all reasonable interpretations of these claims, marketers should not make unqualified general environmental benefit claims.
- (c) Marketers can qualify general environmental benefit claims to prevent deception about the nature of the environmental benefit being asserted. To avoid deception, marketers should use clear and prominent qualifying language that limits the claim to a specific benefit or benefits. Marketers should not imply that any specific benefit is significant if it is, in fact, negligible. If a qualified general claim conveys that a product is more environmentally beneficial overall because of the particular touted benefit(s), marketers should analyze trade-offs resulting from the benefit(s) to determine if they can substantiate this claim.
- (d) Even if a marketer explains, and has substantiation for, the product’s specific environmental attributes, this explanation will not adequately qualify a general environmental benefit claim if the advertisement otherwise implies deceptive claims. Therefore, marketers should ensure that the advertisement’s context does not imply deceptive environmental claims.

Source: “Guides for the Use of Environmental Marketing Claims,” Federal Trade Commission, 2012, <https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf>.

REVENUE FROM SUSTAINABLE PRODUCTS AND SERVICES

In 2013, the most recent year for which we were able to obtain most data, the 12 non-automobile companies in our sample generated on average more than US\$12 billion in revenue from sustainable products and services. On average, this represents 21 percent of total revenues.

The five industrial companies in our sample generated one-third of revenues from sustainable products and services on average and had some of the highest ratios among the 12 non-automobile companies in our sample. Philips, for instance, generated more than half of the company's revenue from its portfolio of "green products," and Siemens's "environmental portfolio" accounted for 43 percent of the company's revenue in 2013.

Table 2.1

Revenue from Sustainable Products and Services (Excluding Automobiles)

USD (billions)					
Company (Industry)	2010	2011	2012	2013	2014
Caterpillar (Industrials)*	n/a	n/a	\$10.9	\$10.0	\$9.8
GE (Industrials)	\$18.2	\$21.4	25.8	30.6	33.9
Philips (Industrials)	8.8	10.3	12.7	14.0	14.1
Siemens (Industrials)	34.3	39.4	40.0	40.7	42.1
Toshiba (Industrials)	n/a	3.6	8.1	15.8	n/a
BASF (Chemicals)	9.8	9.0	8.9	8.6	n/a
Dow Chemical (Chemicals)	2.3	2.9	4.0	5.7	n/a
DuPont (Chemicals)	1.6	1.9	2.0	2.5	n/a
Panasonic (Household Durables)†	n/a	10.5	12.3	7.2	15.5
Kimberly-Clark (Household Products)	2.0	2.7	4.6	7.8	n/a
Johnson & Johnson (Pharmaceuticals)	n/a	n/a	n/a	8.0	8.0
Allianz (Insurance)	n/a	n/a	n/a	1.5	1.7
AVERAGE	\$11.0	\$11.3	\$12.9	\$12.7	\$17.9

*Caterpillar's 2012 figures are the company's unreported estimates and were not verified through auditing protocol, unlike figures for more recent years.

†The significant increase from 2013-2014 is due to an expansion of the definition of products included in Panasonic's portfolio.

Notes: "n/a" for figures from 2010 to 2013 indicates data were not tracked at that time. For 2014, "n/a" indicates figures were not available at time of publication but may be forthcoming. Data for 2014 are shown in the table for reference but not depicted in aggregate in charts or included in our analysis. Figures not originally disclosed in US dollars have been converted using annual average exchange rates (for details see "Methodology").

Sources: Revenue data from the following company-defined portfolios: Caterpillar "Sustainable Progress," GE "EcomaginationSM," Philips "Green Products," Siemens "Environmental Portfolio," Toshiba "Excellent ECPs," BASF "climate protection products," Dow Chemical "products highly advantaged by sustainable chemistry," DuPont "products that reduce GHG emissions," Panasonic "Superior Green Products," Kimberly-Clark "ecoLOGICAL," Johnson & Johnson "Earthwards[®]," and Allianz "Green Solutions." For full source information, please see "Revenue Data" in the Appendix.

Table 2.2

Revenue from Sustainable Products and Services as a Percentage of Total Revenue

Company (Industry)	2010	2011	2012	2013	2014
Caterpillar (Industrials)	n/a	n/a	17%	18%	18%
GE (Industrials)	21%	22%	25	30	31
Philips (Industrials)	36	39	46	50	52
Siemens (Industrials)	41	42	43	43	46
Toshiba (Industrials)	n/a	5	12	25	n/a
BASF (Chemicals)	12	9	10	9	n/a
Dow Chemical (Chemicals)	4	5	7	10	n/a
DuPont (Chemicals)	5	6	6	7	n/a
Panasonic (Household Durables)†	n/a	10	13	10	22
Kimberly-Clark (Household Products)	10	13	22	37	n/a
Johnson & Johnson (Pharmaceuticals)	n/a	n/a	n/a	11	11
Allianz (Insurance)	n/a	n/a	n/a	1	1
AVERAGE	18%	17%	20%	21%	26%

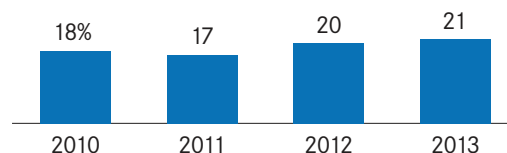
*Caterpillar's 2012 figures are the company's unreported estimates and were not verified through auditing protocol, unlike figures for more recent years.

†The significant increase from 2013-2014 is due to an expansion of the definition of products included in Panasonic's portfolio.

Notes: "n/a" for figures from 2010 to 2013 indicates data were not tracked at that time. For 2014, "n/a" indicates figures were not available at time of publication but may be forthcoming. Data for 2014 are shown in the table for reference but not depicted in aggregate in charts or included in our analysis.

Chart 2.1

Revenue from Sustainable Products and Services as a Percentage of Total Revenue (AVERAGE)



Sources: Figures were calculated by The Conference Board with data from the following company-defined portfolios: Caterpillar "Sustainable Progress," GE "EcomaginationSM," Philips "Green Products," Siemens "Environmental Portfolio," Toshiba "Excellent ECPs," BASF "climate protection products," Dow Chemical "products highly advantaged by sustainable chemistry," DuPont "products that reduce GHG emissions," Panasonic "Superior Green Products," Kimberly-Clark "ecoLOGICAL," Johnson & Johnson "Earthwards[®]," and Allianz "Green Solutions." For full source information, please see "Revenue Data" in the Appendix.

Siemens also reported the highest absolute figure among the entire sample, with over US\$40 billion in revenues generated from this portfolio. This was followed by GE with revenues from EcomaginationSM totaling US\$31 billion in 2013.

The three chemical companies in our sample generated 9 percent of revenue from sustainable products and services on average, with little variation. A difference of only 3 percentage points separates the low and high ends. Dow, for example, generated 10 percent of revenues—almost US\$6 billion—from its portfolio of “products highly advantaged by sustainable chemistry.”

Allianz, the insurance company in our sample, generated about 1 percent of total revenues from its portfolio of “green solutions.” This suggests there is still significant room for growing revenues from these products and solutions, particularly given the overall growth in sustainable insurance products. (See box, “The Rise in Sustainable Insurance Products,” page 29.)

ALTERNATIVE FUEL VEHICLES

In addition to the 12 companies with sustainable product portfolios, our research also includes estimates of alternative fuel vehicle sales for four automobile companies: Ford, Honda, Nissan, and Toyota (Daimler is included in the R&D section of this report). All of these companies offer some form of alternative fuel vehicle portfolio, though the technologies preferred vary across companies. Nissan, for example, places a strong emphasis on full electric vehicles, such as the Nissan LEAF, as well as fuel-cell electric vehicles. Nissan launched the LEAF in December 2010 as the first mass-produced zero-emissions vehicle. Toyota and Honda focus primarily on hybrid vehicles, such as the Toyota Prius and the Honda Acura Hybrid, and on developing hydrogen fuel-cell technologies. Ford and Daimler focus more broadly on hybrid and electric vehicles.

The automobile industry is in the midst of a transformation both challenging and conducive to innovation and growth. Regulatory pressure to improve fuel efficiency and reduce emissions as well as growing demand for alternative fuel vehicles (from both commercial customers and consumers) are spurring innovation in an industry that plays a key part in the transition towards a low-carbon economy.

Company fleets and city governments are looking for ways to reduce their environmental impact, in part driving demand for alternative fuel vehicles. The electrification of mobility is also generating opportunities for automobile companies to become increasingly involved in product and service collaborations with companies in other industries for initiatives such as the development of smart grid connections, linkages with smart appliances, and advanced battery and energy storage technologies.

Table 2.3
Sales of Alternative Fuel Vehicles (Units)

Company (Industry)	2010	2011	2012	2013
Ford (Automobiles)	35,496	27,158	35,034	86,000
Honda (Automobiles)	170,026	200,000	231,440	187,851
Nissan (Automobiles)	n/a	22,000	26,976	47,716
Toyota (Automobiles)	690,100	628,900	1,219,000	1,279,000
AVERAGE	298,541	219,515	378,113	400,142

Notes: These figures are based on a review of publicly available sources. Figures for Ford, Honda, and Toyota refer to hybrid vehicle sales (Ford figures are US-only). Figures for Nissan refer to sales of Nissan Leaf. “n/a” indicates figures were not tracked or not available at time of publication.

Sources:
 Ford: Green Car Reports, September 2014 (2013 data); Automotive News, January 2013 (2012–2010 data)
 Honda: WardsAuto, March 2014 (2013 data); Electric Vehicles Research, October 2013 (2012 data); Honda, October 2012 (2011 data); WardsAuto, November 2011 (2010 data)
 Nissan: Renault-Nissan, 2014, 2013, 2012
 Toyota: Toyota Motor Sales, USA, 2014
 For full source material, see “Alternative Fuel Vehicle Sales Data” in the Appendix.

Table 2.4
Alternative Fuel Vehicle Sales as a Percentage of Total Vehicle Sales (Units)

Company (Industry)	2010	2011	2012	2013
Ford (Automobiles)	1%	0%	1%	1%
Honda (Automobiles)	5	6	6	4
Nissan (Automobiles)	n/a	0	1	1
Toyota (Automobiles)	10	9	17	14
AVERAGE	5%	4%	6%	5%

Notes: These figures are based on a review of publicly available sources. Figures for Ford, Honda, and Toyota refer to hybrid vehicle sales (Ford figure are US-only). Figures for Nissan refer to sales of Nissan Leaf. “n/a” indicates figures were not tracked or not available at time of publication.

Source: Figures were calculated by The Conference Board from publicly available sources. For full source information, please see “Alternative Fuel Vehicle Sales Data” and “Overall Vehicle Sales Data” in the Appendix.

Sales of alternative fuel vehicles still represent a small percentage of total vehicle sales for most companies. For example, among the four automobile companies in our sample, the average total sales of alternative fuel vehicles in 2013 amounted to slightly more than 400,000 vehicles, only about 5 percent of total vehicle sales for these four companies.¹⁹ There is a relatively wide gap between the companies, with Toyota recording the highest sales at almost 1.3 million hybrid vehicles, about 14 percent of the company’s total vehicle sales in 2013. Honda’s hybrid vehicles accounted for about four percent of total vehicle sales in 2013, while Ford and Nissan’s shares of alternative fuel vehicles sales were a modest one percent.

While absolute figures remain low, the growth in sales of alternative fuel vehicles has been impressive. Between 2010 and 2013, average total vehicle sales for Ford, Honda, and Toyota grew by 19 percent, whereas alternative fuel vehicle sales by these companies grew by an average of 79 percent.²⁰ Ford has seen the greatest growth, with sales of hybrid vehicles rising by over 140 percent during this period, compared to a growth in overall vehicle sales of about 15 percent. Toyota’s sales of hybrid vehicles also significantly outpaced total vehicle sales, reaching almost 1.3 million hybrid vehicles in 2013, an 85 percent increase from the 2010 figure.

Table 2.5
Change in Alternative Fuel Vehicle Sales vs. Total Vehicle Sales (2010 vs. 2013)

Company (Industry)	Change in Alternative Fuel Vehicles Sales (2010 vs. 2013)	Change in Total Vehicle Sales (2010 vs. 2013)
Ford (Automobiles)	142%	15%
Honda (Automobiles)	10	20
Toyota (Automobiles)	85	23
AVERAGE	79%	19%

Notes: These figures are based on a review of publicly available sources. Figures for Ford, Honda, and Toyota refer to hybrid vehicle sales (Ford figure are US-only). Figures for Nissan refer to sales of Nissan Leaf.

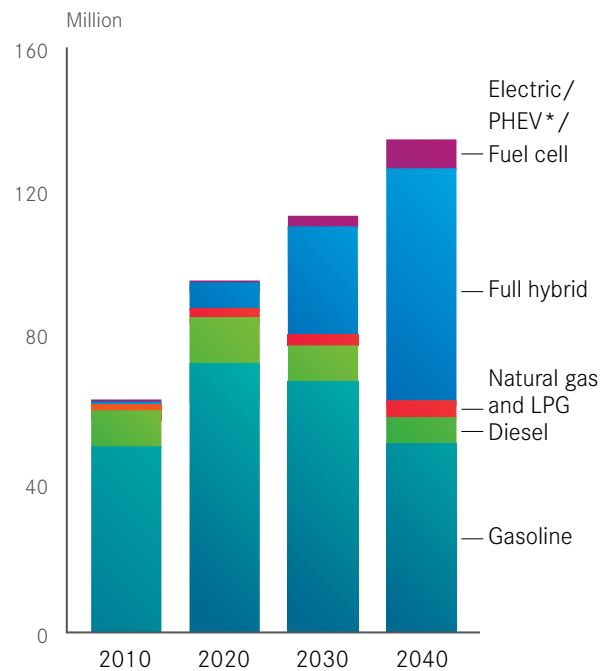
Source: Change in alternative fuel vehicle sales was calculated by The Conference Board from publicly available sources. Change in total vehicle sales was calculated based on data from annual reports. For full source information, please see “Alternative Fuel Vehicle Sales Data” and “Overall Vehicle Sales Data” in the Appendix.

19 Note: These figures are based on a review of publicly available sources. For full source information, see the Appendix.

20 Nissan values are not shown because 2010 figures are not available.

There is significant opportunity for growth in this industry, and evolving innovation in technologies is also likely accelerate the penetration of alternative fuel vehicles. According to ExxonMobil’s 2015 release of its *Outlook for Energy* report, sales of hybrid vehicles are projected to grow from one percent of new-car sales in 2010 to almost 50 percent of sales by 2040, making up about one-third of the global fleet at that time.²¹ Other alternative fuel vehicles, such as plug-in hybrid and full electric cars, are estimated by the *Outlook* to make more modest gains, primarily due to higher cost and functional constraints compared to alternatives. ExxonMobil projects electric vehicles to account for about five percent of the global fleet in 2040.

Annual new LDV sales by type



*Plug-in hybrid electric vehicles

Source: 2015 *Outlook for Energy*, ExxonMobil.

21 *The Outlook for Energy: A View to 2040*, ExxonMobil, p. 19, http://cdn.exxonmobil.com/~media/Reports/Outlook%20For%20Energy/2015/2015-Outlook-for-Energy_print-resolution.pdf.

In addition to growing consumer interest in alternative fuel vehicles, government incentives and regulations also play an important part in driving sales of these vehicles. Incentivizing the use of alternative fuel vehicles is a key component of the carbon reduction strategies of several governments. For example, in July of 2014, China's central government mandated that electric vehicles make up at least 30 percent of all government vehicle purchases by 2016 and plans to increase the ratio after this date. The government also announced that alternative fuel vehicles would be exempt from a purchase tax through the end of 2017.²² Purchase incentives, grants, and subsidies have also been in existence for a number of years in several other regions, including Japan, India, Europe, and the United States.

Sustainable products are significantly contributing to revenue growth as revenues from these products grew by 91 percent between 2010 and 2013, while overall company revenues grew by 15 percent.

REVENUE GROWTH FROM SUSTAINABLE PRODUCTS AND SERVICES

Of the 12 non-automobile companies in our sample, we have historical data from 2010 for seven companies. Among these seven companies, between 2010 and 2013 revenue from sustainable products and services grew on average by 91 percent. By comparison, overall company revenues grew on average by 15 percent during the same period.

Kimberly-Clark's ecoLOGICAL portfolio generated the greatest growth in revenue among the sample, growing almost 300 percent since 2010. In 2013, revenue from this portfolio totaled over US\$7.8 billion and accounted for 37 percent of Kimberly-Clark's revenue, up from about US\$2 billion or 10 percent of the company's revenue in 2010.

Dow's portfolio of "products highly advantaged by sustainable chemistry" also saw significant growth—the second-highest among the sample. Revenues from this portfolio grew by 147 percent since 2010, from about US\$2 billion to almost US\$6 billion in 2013.

Among the industrial companies in the sample, GE and Philips experienced similar growth rates in revenues from their sustainable product portfolios. GE's EcomaginationSM revenues grew by 72 percent between 2010 and 2013, while Philips' portfolio of "green products" grew by 60 percent during the same period.

Revenues from sustainable products have significantly outpaced overall company revenues in the majority of companies in our sample. With the exception of BASF, which experienced a slight decrease in revenue from its portfolio of "climate protection products," revenues from sustainable products have grown at healthy rates since 2010.

²² "China Requires 30% of State Cars Use Alternative Energy," Bloomberg, July 14, 2014, <http://www.bloomberg.com/news/articles/2014-07-13/china-targets-30-new-government-vehicles-use-alternative-energy>.

Growth in sustainable product portfolios can be attributed in part to the incorporation of sustainable products into company strategic planning and target-setting. The following are some examples of companies that have set sustainable product goals and targets:

- **GE** set a goal in 2005 to grow EcomaginationSM-related revenues to US\$20 billion and at twice the rate of GE’s overall industrial revenue. Since the initiative’s launch, EcomaginationSM revenues have grown at four times the rate of GE’s overall industrial business.
- **Toshiba** set a goal to reach US\$18 billion in annual sales of “Excellent Environmentally Conscious Products” (ECPs) in FY 2015.
- **Dow** set a target in 2006 to derive 10 percent of total revenues from “products that are highly advantaged by sustainable chemistry” by 2015. This target was reached in 2013.
- **DuPont** set a goal in 2011 to increase annual revenue from “products that increase energy efficiency or significantly reduce GHG emissions” by at least US\$2 billion by 2015. This goal was surpassed in 2012.
- **Kimberly-Clark** set a goal in 2011 to achieve 25 percent of revenue from environmentally innovative products by 2015, a target which was surpassed in 2013.
- **Johnson & Johnson** set a goal to reach 60 Earthwards[®] products by 2015. This goal was met early with a total of 73 Earthwards[®] products at the end of 2014.

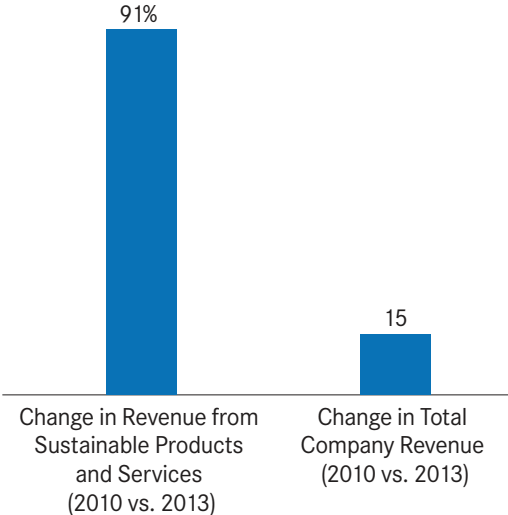
“Setting ambitious goals provides context, focus, and organizational excitement for a company’s sustainability strategy and success.”

Linda Fisher, Chief Sustainability Officer, DuPont

Table 2.6
Change in Revenue from Sustainable Products and Services vs. Change in Total Company Revenue (2010 vs. 2013)

Company (Industry)	Change in Revenue from Sustainable Products and Services (2010 vs. 2013)	Change in Total Company Revenue (2010 vs. 2013)
GE (Industrials)	72%	22%
Philips (Industrials)	60	14
Siemens (Industrials)	19	13
BASF (Chemicals)	-13	16
Dow Chemical (Chemicals)	147	6
DuPont (Chemicals)	56	29
Kimberly-Clark (Household Products)	296	7
AVERAGE	91%	15%

Chart 2.2
Change in Revenue from Sustainable Products and Services vs. Change in Total Company Revenue (AVERAGE, 2010 vs. 2013)



Sources: Figures were calculated by The Conference Board with data from the following company-defined portfolios: GE “EcomaginationSM,” Philips “Green Products,” Siemens “Environmental Portfolio,” BASF “climate protection products,” Dow Chemical “products highly advantaged by sustainable chemistry,” DuPont “products that reduce GHG emissions,” and Kimberly-Clark “ecoLOGICAL.” For full source information, please see “Revenue Data” in the Appendix.

The Rise in Sustainable Insurance Products

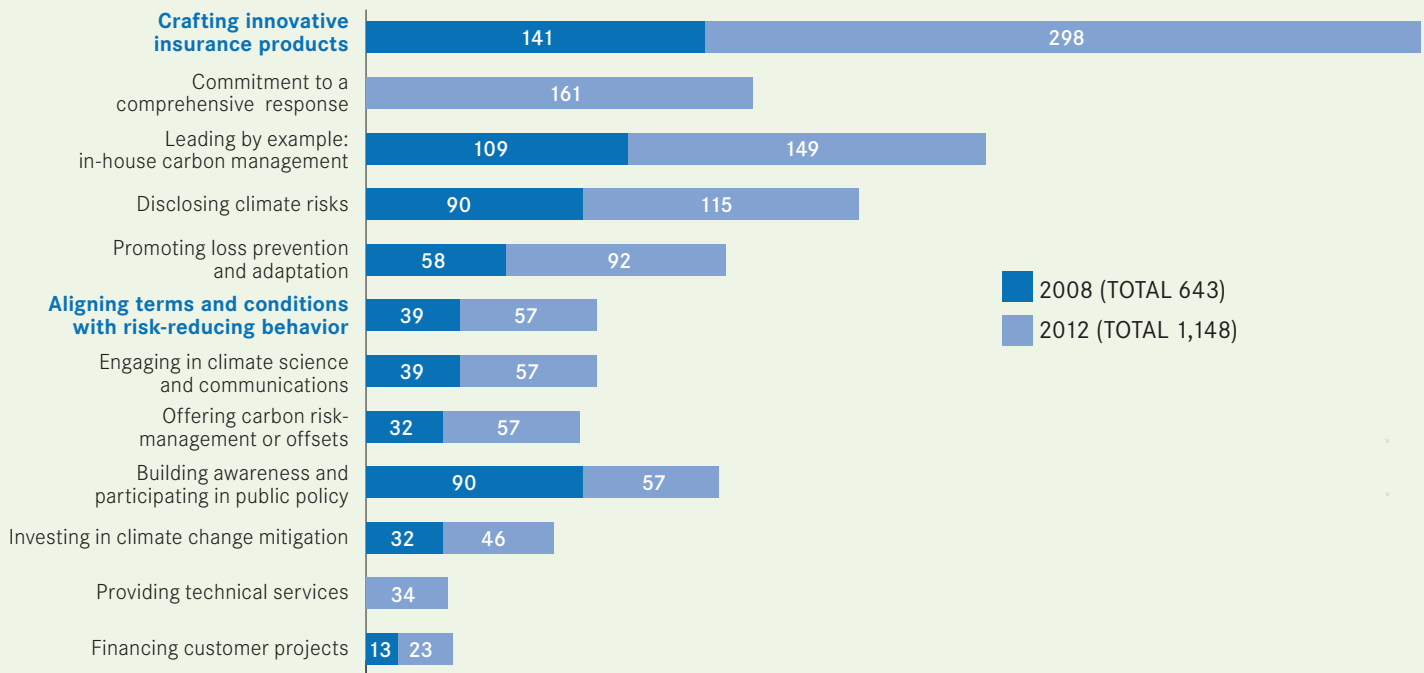
Insurance companies' significant potential contribution to sustainable products stems in large part from the industry's size. Globally, premiums written by insurance companies surpassed US\$4.6 trillion in 2013, a 1.4 percent increase from the 2012 figure.²³ Non-life premiums totaled over US\$2 trillion in 2013, a 2.3 percent increase from 2012. It is difficult to quantify exactly how much of this total can be attributed to sustainable or green insurance products, though there are clear indications that sustainable insurance products are becoming more widespread. For example, a study identified

a total of about 1,148 green insurance activities in 2012, of which 26 percent were related to innovative insurance products (e.g., lower premiums for hybrid vehicles or green buildings) and 5 percent were related to aligning terms and conditions with risk-reducing behavior (e.g., as pay-as-you-drive insurance products).²⁴ This is a significant increase from the 643 activities identified in 2008, of which about 22 percent were related to crafting innovative insurance products and six percent were related to aligning terms and conditions with risk-reducing behavior.²⁵

Chart 2.3

Insurer Climate Change Adaptation and Mitigation Activities

The number of green insurance products offered by insurers almost doubled between 2008 and 2012



Source: Evan Mills, Green Insurance Data Service.

23 *World insurance in 2013: Steering towards recovery*, Swiss Re, 2014, p. 6, http://media.swissre.com/documents/sigma3_2014_en.pdf.

24 Evan Mills, "The Greening of Insurance," *Science*, December 14, 2012, vol. 338, <http://evanmills.lbl.gov/pubs/pdf/science-2012-mills-1424-5.pdf>.

25 Evan Mills, *From Risk to Opportunity: Insurer Responses to Climate Change*, Ceres, April 2009, p. 1, <http://insurance.lbl.gov/opportunities/risk-to-opportunity-2008.pdf>.

SUSTAINABILITY R&D SPENDING

Figures for sustainability R&D spending are shown for eight companies on page 31. For seven companies, 2013 data were available. On average, these seven companies allocated almost US\$1.6 billion to sustainability R&D spending, or about 38 percent of their total R&D spending.

The two automobile companies in this sample, Nissan and Daimler, each had the highest ratio and absolute values of R&D spending allocated to sustainability. Nissan reports allocating about 70 percent of the company's R&D budget to environmental technologies²⁶, while Daimler reports spending about half of R&D on green technologies.²⁷ In 2013, this amounted to about US\$3.5 billion in sustainability R&D spending by each company.

Among the few companies that track sustainability-specific R&D, about two fifths of R&D spending is allocated to sustainability on average.

After the two automobile companies in our sample, DuPont had the next highest share of R&D spending allocated to sustainability. Environmental R&D investment for new product development accounted for 46 percent of DuPont's total R&D budget in 2013, or about US\$1 billion.²⁸ BASF, meanwhile, reports spending about one third of the company's R&D budget on product and process innovations where the R&D target is related to resource efficiency and climate protection.

Among the industrials in our sample, GE had the highest share of R&D spending allocated to sustainability. In 2013, GE allocated about 39 percent of the company's R&D budget to its EcomaginationSM portfolio, or about US\$1.8 billion. This allocation grew to 54 percent in 2014. Going forward, the company expects these investments to focus on advancing five key areas GE believes are critical to a sustainable global economy:

developing new natural gas ecosystems across exploration and production, power generation, and transportation systems; driving next generation renewables that are both lower cost and better integrated into larger power networks; improving industrial and commercial water productivity; increasing resource productivity through the deployment of smart machine-to-machine software and analytics; and working towards more optimal, integrated systems at the home, building and municipal levels. (See company profile on page 60.)

Philips, meanwhile, allocated almost one-fourth of R&D spending to "green innovation," which includes developing the company's green products portfolio; tackling water, air, and waste challenges; and developing advances in materials and energy efficiency. Over half of Philips' spending on green innovation is allocated to the company's lighting business, which, among other innovations, has introduced light-as-a-service solutions (whereby light service is charged on a subscription basis) as a more sustainable alternative to the traditional business of selling lighting fixtures. (See company profile on page 76.)

"While we continue with our focus on reducing our operational impact on the environment and delivering more energy efficient and sustainable hardware products, we understand that the greatest opportunity we have as a company to contribute to the sustainability of our planet is through innovation and the application of our technologies and solutions to solve the sustainability challenges of our clients."

Edan Dionne, Director, Corporate Environmental Affairs, IBM

26 Nissan Annual Report 2012, p. 4, http://www.nissan-global.com/EN/DOCUMENT/PDF/AR/2012/AR2012_E_All.pdf.

27 Daimler Annual Report 2014, <http://ar2014.daimler.com/management-report/sustainability/research-and-development>.

28 Note: This figure excludes environmental R&D investment devoted to process improvements.

Many companies integrate sustainability aspects throughout the R&D process and do not distinguish sustainability R&D from general R&D spending. For this reason sustainability R&D figures are not available for several companies in our sample. However, the company profiles in this report offer some qualitative details on types of R&D sustainability initiatives:

- Johnson & Johnson focuses product development sustainability efforts on opportunities for green chemistry, removal of materials of concern (such as lead, cadmium, and mercury, among others), and more sustainable packaging solutions. The company is also working on initiatives focused on end of product life, such as new ways to encourage recycling and reprocessing of equipment.
- Kimberly-Clark’s environmental R&D is targeted to advancing research in materials. Specifically, the company is exploring the potential use of alternative materials to limit dependence on wood fiber, as well as efforts to reduce material weight and thus minimize solid waste.

Table 2.7
R&D Spending Allocated to Sustainability

USD (billions)					
Company (Industry)	2010	2011	2012	2013	2014
GE (Industrials)	\$1.8	\$2.3	\$1.7	\$1.8	\$2.3
Philips (Industrials)	0.4	0.5	0.6	0.5	0.6
Siemens (Industrials)	n/a	1.3	1.9	n/a	n/a
Toshiba (Industrials)	0.2	0.3	0.2	0.2	n/a
BASF (Chemicals)	0.6	0.7	0.7	0.8	0.8
DuPont (Chemicals)	0.7	0.8	0.9	1.0	n/a
Daimler (Automobiles)	3.1	3.7	3.5	3.5	3.6
Nissan (Automobiles)	3.1	3.6	4.0	3.5	n/a
AVERAGE	\$1.4	\$1.7	\$1.7	\$1.6	\$1.8

Notes: “n/a” for figures from 2010 to 2013 indicates data were not tracked at that time. For 2014, “n/a” indicates figures were not available at time of publication but may be forthcoming. Data for 2014 are shown for reference but not depicted in aggregate in charts or included in our analysis. Figures not originally disclosed in US dollars have been converted using annual average exchange rates (for details see “Methodology”).

Sources: R&D data disclosed by companies related to the following portfolios or technologies: GE “EcomaginationSM,” Philips “Green Innovation,” Siemens “Environmental Portfolio,” Toshiba “Excellent ECPs,” BASF “product and process innovations where the R&D target is related to resource efficiency and climate protection,” DuPont “environmental R&D investment for new product development (excludes investment devoted to process improvements),” Daimler “green technologies R&D,” and Nissan “environmental technologies R&D.” For full source information, please see “R&D Data” in the Appendix.

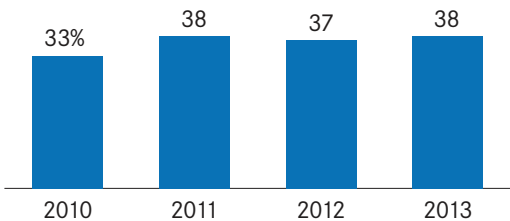
- Caterpillar’s future R&D investments in sustainable products will likely be targeted to advancing research in energy efficiency and emissions reductions of engines, drive trains, and mechanical components; hybrid hydraulic technology to reduce fuel consumption and emissions from excavators and other products with hydraulic components; and next generation powertrains to allow use of alternative energy sources such as biofuels, waste gases, or biogases.

Table 2.8
Sustainability R&D Spending as a Percentage of Total R&D Spending

Company (Industry)	2010	2011	2012	2013	2014
GE (Industrials)	46%	50%	38%	39%	54%
Philips (Industrials)	22	24	26	24	28
Siemens (Industrials)	n/a	26	35	n/a	n/a
Toshiba (Industrials)	5	7	5	7	n/a
BASF (Chemicals)	33	33	33	33	n/a
DuPont (Chemicals)	40	42	41	46	n/a
Daimler (Automobiles)	50	50	50	50	n/a
Nissan (Automobiles)	n/a	70	70	70	n/a
AVERAGE	33%	38%	37%	38%	41%

Notes: “N/a” for figures from 2010 to 2013 indicates data were not tracked at that time. For 2014, “n/a” indicates figures were not available at time of publication but may be forthcoming. Data for 2014 are shown in the table for reference but not depicted in aggregate in charts or included in our analysis.

Chart 2.4
Sustainability R&D Spending as a Percentage of Total R&D Spending (AVERAGE)



Sources: Figures were calculated by The Conference Board from data disclosed by companies related to the following portfolios or technologies: GE “EcomaginationSM,” Philips “Green Innovation,” Siemens “Environmental Portfolio,” Toshiba “Excellent ECPs,” BASF “product and process innovations where the R&D target is related to resource efficiency and climate protection,” DuPont “environmental R&D investment for new product development (excludes investment devoted to process improvements),” Daimler “green technologies R&D,” and Nissan “environmental technologies R&D.” For full source information, please see “R&D Data” in the Appendix.

GROWTH IN SUSTAINABILITY R&D SPENDING

On average, the seven companies in our sample (those with sustainability R&D data back to 2010) saw sustainability R&D spending increase by 21 percent between 2010 and 2013. By comparison, overall R&D spending by these companies increased by 15 percent during this same period.

Among these companies, DuPont saw the greatest percent increase, with the amount of R&D allocated to sustainability increasing by 50 percent from 2010 to 2013. The company's overall R&D spending also increased significantly, rising 30 percent since 2010. These investments have helped DuPont grow revenue from its portfolio of products designed to reduce GHG emissions by more than 50 percent since 2010.

Sustainability R&D spending outpaces overall R&D spending in our sample

Notably, Toshiba's R&D spending on "Environmentally Conscious Products" (ECPs) increased 16 percent since 2010, despite a decrease in the company's overall R&D spending from 2010 to 2013.²⁹ This has helped Toshiba grow revenues from its "Excellent ECPs" from about US\$3.6 billion in 2011 to almost US\$16 billion in 2013, a more than four-fold increase.

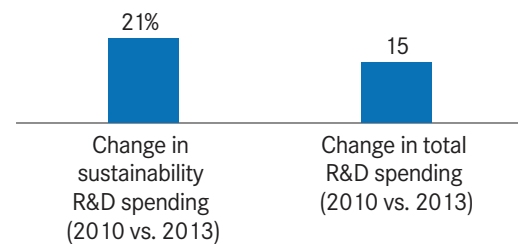
Table 2.9

Change in Sustainability R&D Spending vs. Change in Total R&D Spending (2010 vs. 2013)

Company (Industry)	Change in sustainability R&D spending (2010 vs. 2013)	Change in total R&D spending (2010 vs. 2013)
GE (Industrials)	0%	19%
Philips (Industrials)	30	16
Toshiba (Industrials)	16	-7
BASF (Chemicals)	24	24
DuPont (Chemicals)	50	30
Daimler (Automobiles)	13	13
Nissan (Automobiles)	13	13
AVERAGE	21%	15%

Chart 2.5

Change in Sustainability R&D Spending vs. Change in Total R&D Spending (AVERAGE, 2010 vs. 2013)



Sources: Figures were calculated by The Conference Board from data disclosed by companies related to the following portfolios or technologies: GE "EcomaginationSM," Philips "Green Innovation," Toshiba "Excellent ECPs," BASF "product and process innovations where the R&D target is related to resource efficiency and climate protection," DuPont "environmental R&D investment for new product development (excludes investment devoted to process improvements)," Daimler "green technologies R&D," and Nissan "environmental technologies R&D." For full source information, please see "R&D Data" in the Appendix.

²⁹ Note: The decrease in Toshiba's overall R&D spending is based on USD figures. If expressed in the original JPY currency, Toshiba's overall R&D spending increased by 3 percent.

Examples of Sustainability R&D Initiatives by Industry

AUTOMOBILES

Sustainability-related R&D spending by automobile companies generally focuses on drive train technologies, vehicle lightweighting, improving fuel efficiency, and energy storage and battery technologies. Some examples of R&D projects include:

- Improving electric mobility technologies, including technologies for plug-in hybrid vehicles, fuel cell vehicles, and electric vehicles;
- Development of more efficient and affordable batteries;
- Improving the efficiency of conventional internal combustion engines;
- Development of intelligent transport systems to reduce traffic congestion; and
- Automatic driving functions that promote predictive driving and can increase efficiency.

CHEMICALS

Sustainability R&D initiatives by chemical companies span a number of focus areas, including energy reduction and climate change-related technologies, increasing usage of renewable materials, and reducing the usage of toxic chemicals. A few examples of sustainability R&D projects include:

- Advanced materials that create more efficient photovoltaic modules and weather-resistant films that protect photovoltaic fuel cells;
- Industrial biotechnology to increase production of ethanol and other alternative biofuels;
- Developing fertilizers that reduce nitrous oxide emissions;
- Increasing food security through the prevention of climate change effects on crops, such as increased erosion and temperature fluctuations;
- Reverse osmosis to tackle water supply;
- Structural adhesives that improve the lightweighting of vehicles and improve safety and fuel efficiency;
- Advanced agricultural products to improve nutrition through reducing trans and saturated fat from consumer diets;
- Insulating materials for the construction and housing industries; and
- Developing organic solar cells, fuel cells, and lithium-ion batteries.

INDUSTRIALS

Sustainability R&D spending among industrials focuses generally on advancing energy-related research and addressing global challenges related to water, waste, and material usage. Examples of some of the sustainability R&D projects by companies in this sector include:

- Developing alternatives to replace water in the hydraulic fracturing process;
- Solutions to increase power plant efficiencies;
- Development of nonpetroleum-based plastics;
- Advancing energy efficiency across the electrification value chain;
- Phasing out traditional lighting with LED lighting;
- Advancing renewable energy technologies;
- Recycling materials to close the materials loop;
- Healthcare system refurbishment to extend the life cycle of healthcare equipment;
- Research in technologies to reduce the use of material resources and replace toxic chemicals;
- Hybrid hydraulic technology; and
- Next generation powertrains that use alternative energy sources such as biofuels, waste gases, or biogases.

TECHNOLOGY

Companies in this sector focus sustainability R&D efforts broadly on energy and resource efficiency. Examples of sustainability R&D projects include:

- Advancing consumer energy management technologies, such as “smart home” technologies;
- Applying computing technologies to better analyze and improve the environmental performance of homes, buildings, and cities;
- Technology to measure and manage natural resources more efficiently, including climate modeling;
- Improvements in product energy efficiency to reduce the energy needed to manufacture and use products;
- Innovation in materials, including reducing material usage and developing materials with lower environmental impacts, such as bio-based plastics; and
- Improving the recyclability and re-use potential of products.

The Role of the Financial Sector: Renewable Energy Investments and Green Bonds

Financial companies play a prominent role in supporting the development of large-scale sustainable products, including renewable energy projects, energy efficiency projects, and water conservation efforts, among others.

There are admittedly numerous types of products or services offered by financial companies that could be classified as “sustainable products.” For practical reasons and to facilitate comparisons, this analysis considers only a few specific activities, based in part on a review of literature on materiality. The following pages discuss these activities as they relate to commercial and investment banks and insurance companies.

This analysis focuses primarily on sustainability-themed lending and project finance (such as carbon finance, clean tech financing, green bonds, and green loans). These represent some of the primary ways financial institutions can help clients invest in advanced environmental technologies. The debt capital markets represent an important mechanism for financing a transition to wider use of low-carbon energy.

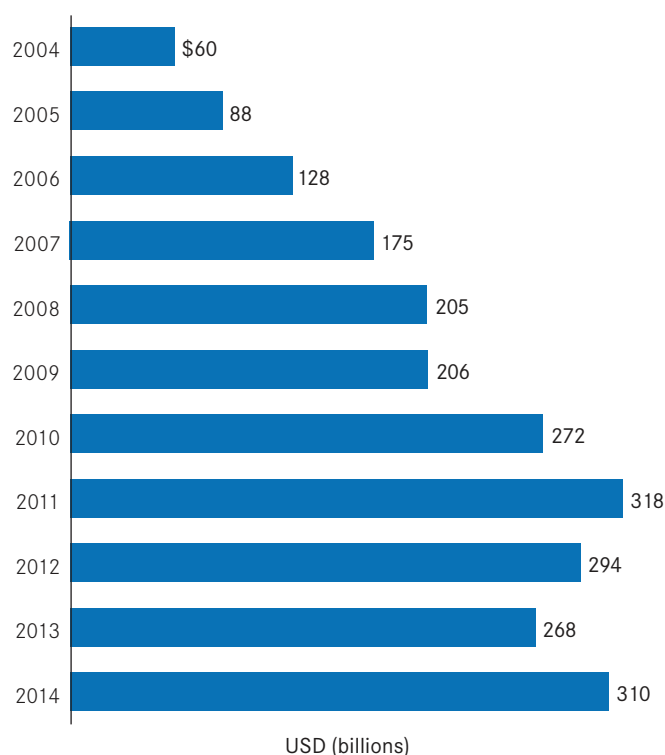
Renewable energy asset financing by S&P Global 100 banks grew by more than 50 percent since 2010

Data from Bloomberg New Energy Finance (BNEF) show total global investments in clean energy reached US\$310 billion in 2014, up from US\$272 billion in 2010 and US\$128 billion in 2006.³⁰ The 2014 figure represents an increase of 142 percent since 2006. By type, asset finance has historically accounted for the greatest share of total clean energy investments, reaching US\$184 billion in 2014 (almost three-fifths of the total clean energy investments in 2014), a 16 percent increase

from the figure recorded in 2013. BNEF estimates investments in clean energy may double by 2030, reaching US\$630 billion.³¹

Chart 2.6
Global New Investments in Renewable Energy (2004–2014)

Global investments in renewable energy reached US\$310 billion in 2014



Note: Values include estimates for undisclosed deals.

Source: *Global Trends in Clean Energy Investment 2014*, Bloomberg New Energy Finance, January 9, 2015, (<http://about.bnef.com/presentations/clean-energy-investment-q4-2014-fact-pack/content/uploads/sites/4/2015/01/Q4-investment-fact-pack.pdf>)

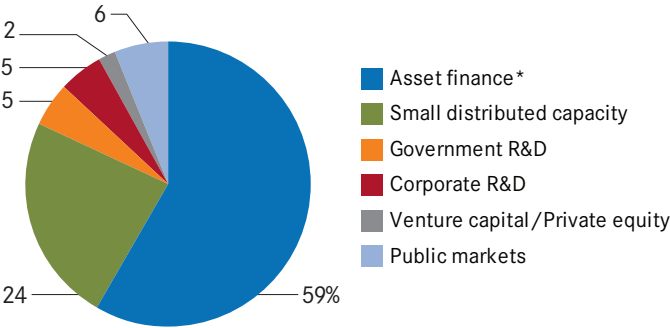
30 *Global Trends in Clean Energy Investment*, Bloomberg New Energy Finance, January 9, 2015, p. 3, <http://about.bnef.com/presentations/clean-energy-investment-q4-2014-fact-pack/content/uploads/sites/4/2015/01/Q4-investment-fact-pack.pdf>.

31 “Strong growth for renewables expected through to 2030,” Bloomberg New Energy Finance, press release, April 22, 2013, <http://about.bnef.com/press-releases/strong-growth-for-renewables-expected-through-to-2030/>.

Data from BNEF show S&P Global 100 banks financed almost US\$6 billion in renewable energy projects in 2014, led by Santander and Société Générale, with each bank financing more than US\$1.3 billion. Total financings for 2014 represent an increase of 52 percent compared to 2010.

Chart 2.7
Global New Investments in Renewable Energy in 2014, by Asset Class

Asset finance accounted for three-fifths of renewable energy investments in 2014, or US\$184 billion



*Asset finance volume adjusted for re-invested equity.
 Note: Values include estimates for undisclosed deals.
 Source: *Global Trends in Clean Energy Investment 2014*, Bloomberg New Energy Finance, January 9, 2015, (<http://about.bnef.com/presentations/clean-energy-investment-q4-2014-fact-pack/content/uploads/sites/4/2015/01/Q4-investment-fact-pack.pdf>).

Table 2.10
Renewable Energy Asset Finance by S&P Global 100 Banks

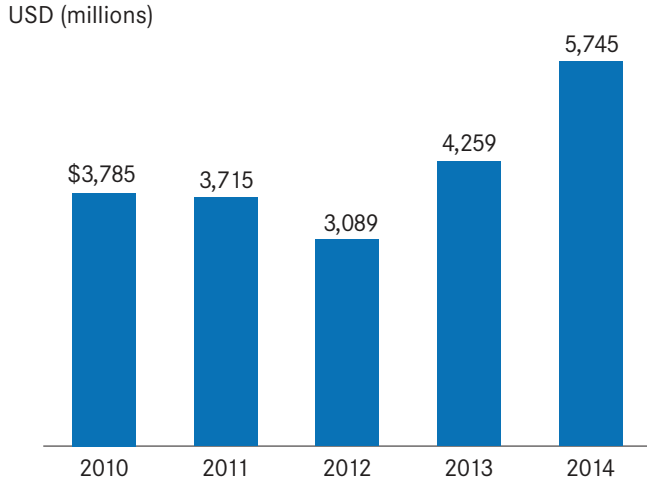
S&P Global 100 banks contributed almost US\$6 billion in renewable energy asset finance in 2014

Company (Industry)	USD (millions)				
	2010	2011	2012	2013	2014
Banco Bilbao Vizcaya Argentaria	\$1,968	\$1,006	\$554	\$0	\$0
Banco Santander	1,817	2,037	981	754	1,347
Barclays	0	0	0	0	208
Citigroup	0	0	0	604	69
Credit Suisse Group	0	0	0	0	488
Deutsche Bank	0	0	792	935	911
Goldman Sachs Group	0	0	0	645	0
ING Groep	0	0	0	552	560
JP Morgan Chase	0	0	0	769	165
Morgan Stanley	0	0	762	0	669
Societe Generale	0	672	0	0	1,328
TOTAL	\$3,785	\$3,715	\$3,089	\$4,259	\$5,745

Note: Figures include project finance and tax equity (tax equity data only tracked beginning in 2013).

Chart 2.8
Renewable Energy Asset Finance by S&P Global 100 Banks

Renewable energy asset finance by S&P Global 100 banks has grown by more than 50 percent since 2010



Source: Totals were calculated by The Conference Board using a subset of data from Bloomberg New Energy Finance League Tables.

What Are Green Bonds?

Green bonds are fixed income financial instruments in which the funds raised are dedicated exclusively to projects and activities that promote climate stability or other environmentally sustainable purposes.

THE GREEN BOND PRINCIPLES

The Green Bond Principles (GBP) are voluntary process guidelines that recommend transparency and disclosure to promote integrity in the development of the Green Bond market. The GBP are intended for broad use. They provide issuers guidance on the key components involved in launching a credible Green Bond; they aid investors by ensuring availability of information necessary to evaluate the environmental impact of a Green Bond; and they assist underwriters by moving the market towards standard disclosures which will facilitate transactions.

The Green Bond Principles were drafted by a group of four banks (Bank of America Merrill Lynch, Citibank, Crédit Agricole, and JPMorgan Chase) and launched in January 2014. The initial 13 signatories to the Principles included the four banks as well as BNP Paribas, Daiwa, Deutsche Bank, Goldman Sachs, HSBC, Mizuho Securities, Morgan Stanley, Rabobank and SEB. Over 80 investors, bond issuers, and intermediaries now support the Green Bond Principles.

The GBP recommend concrete process and disclosure for issuers which investors, banks, investment banks, underwriters, placement agents, and others may use to understand the characteristics of any given Green Bond. The GBP have four components:

- Use of proceeds
- Process for project evaluation and selection
- Management of proceeds
- Reporting

TYPES OF GREEN BONDS

The International Capital Market Association defines four main types of Green Bonds:^a

- **Green Use of Proceeds Bond:** a standard recourse-to-the-issuer debt obligation for which the proceeds shall be moved to a sub-portfolio or otherwise tracked by the issuer and attested to by a formal internal process that will be linked to the issuer's lending and investment operations for projects. Pending such investment, it is recommended that the issuer make known to investors the intended types of eligible investments for the balance of unallocated proceeds.
- **Green Use of Proceeds Revenue Bond:** a non-recourse-to-the-issuer debt obligation in which the credit exposure in the bond is to the pledged cash flows of the revenue streams, fees, taxes etc., and the Use of Proceeds of the bond goes to related or unrelated Green Project(s). The proceeds shall be moved to a sub-portfolio or otherwise tracked by the issuer and attested to by a formal internal process that will be linked to the issuer's lending and investment operations for specific projects. Pending such investment, it is recommended that the issuer make known to investors the intended types of eligible investments for the balance of unallocated proceeds.
- **Green Project Bond:** a project bond for a single or multiple Green Project(s) for which the investor has direct exposure to the risk of the project(s) with or without potential recourse to the issuer.
- **Green Securitized Bond:** a bond collateralized by one or more specific projects. The first source of repayment is generally the cash flows of the assets. This type of bond covers, for example, asset-backed securitizations of rooftop solar PV and/or energy efficiency assets.

^a Source: International Capital Market Association, <http://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Green-Bonds-Principles-2014.pdf>.

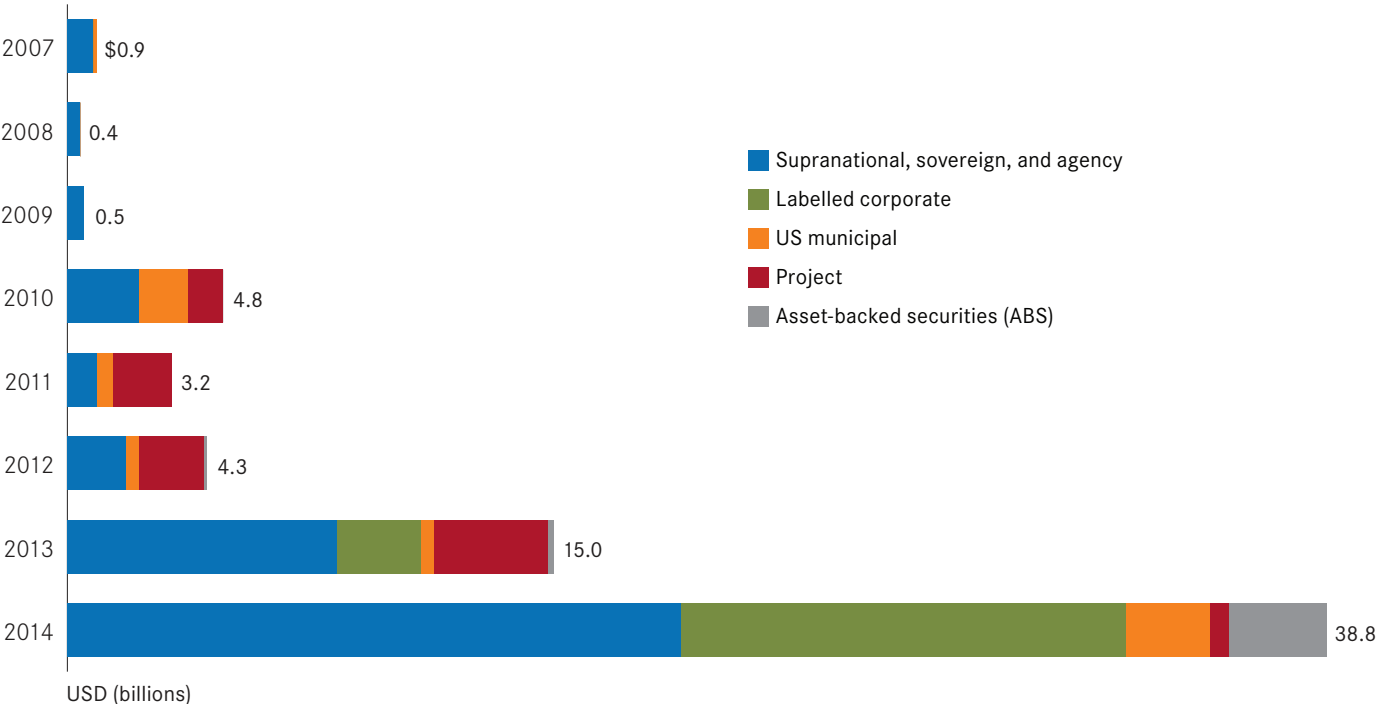
Green bonds represent a small but rapidly growing share of the bond market

Recent data on green bonds show almost US\$39 billion were sold in 2014, more than two and a half times the US\$15 billion sold in 2013 and an increase of over 700 percent from 2010.³² This growth was driven primarily by significant increases in green bond issuance from corporations (a five-fold increase compared to 2013), as well as increases in issuance from institutions, such as the World Bank.

While green bonds are a small component of the total fixed income market, representing only about three percent of the value of the US corporate bond market in 2014, growth has been significant: in 2012 green bonds made up just 0.4 percent of the US corporate bond market.³³

Chart 2.9
Global Green Bond Issuance, by Type (2007-2014)

Almost US\$39 billion in green bonds were issued in 2014, primarily from institutions and corporations



Source: Green Bonds Market Outlook, Bloomberg New Energy Finance, Q1 2015, January 26, 2015.

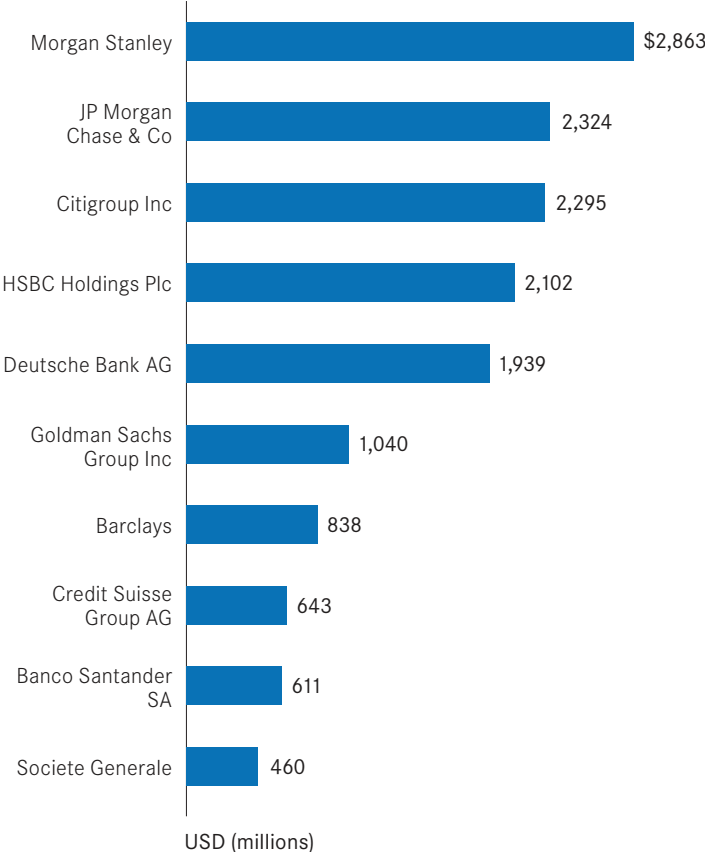
³² Q1 2015 Green Bonds Market Outlook, Bloomberg New Energy Finance, January 26, 2015.

³³ Green Bonds Market Outlook 2014, Bloomberg New Energy Finance, June 2, 2014, p. 3, <http://about.bnef.com/white-papers/green-bonds-market-outlook-2014/content/uploads/sites/4/2014/06/2014-06-02-Green-bonds-market-outlook-2014.pdf>.

S&P Global 100 banks underwrote over US\$15 billion green bonds in 2014, with Morgan Stanley leading this sample with almost US\$3 billion in green bonds underwritten. JPMorgan, Citigroup, and HSBC each also underwrote more than US\$2 billion in green bonds.

Understandably, there is variation in the specific mechanisms financial companies choose to use for their sustainable lending and project finance activities. Government regulation and incentives can play a significant role in determining what mechanisms companies choose. For example, US tax credits for renewable energy projects make clean tech financing through tax equity particularly attractive for US institutions. JPMorgan Chase, consequently, has a significant presence in clean tech financing through tax equity. This is in addition to the company’s growing activity in green bonds.

Chart 2.10
S&P Global 100 Banks Underwrote over US\$15 Billion in Green Bonds in 2014



Source: 2014 Green Bond League Tables, Bloomberg New Energy Finance, January 26, 2015

Investments in Renewable Energy Represent a Significant Opportunity for Insurers

Allianz has doubled its cumulative investments in renewable energy since 2010

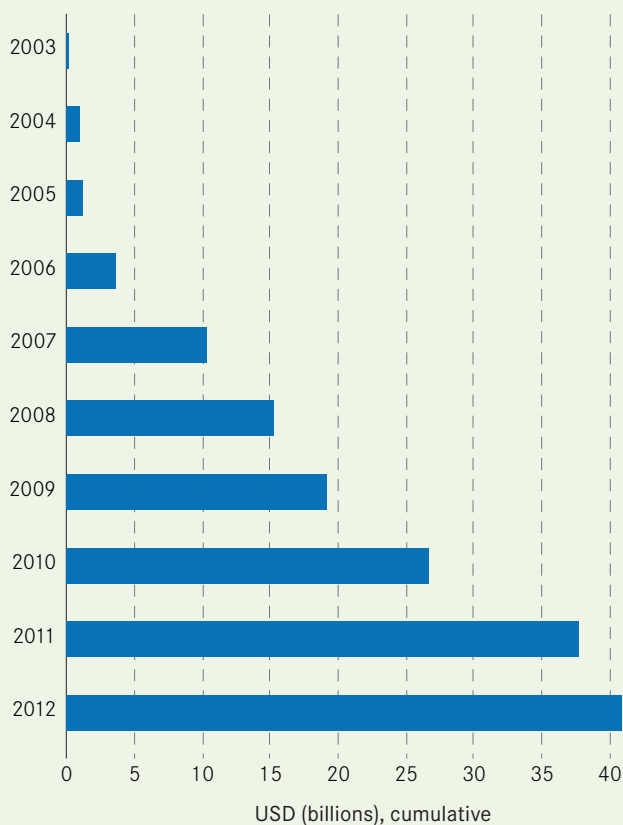
Beyond green insurance products, insurance companies play an important role in advancing investments in renewable energy. While the amount invested in green infrastructure represents a small fraction of the nearly US\$27 trillion in assets under management (in 2013)³⁴, green investments in the industry are undoubtedly growing: research shows that in 2012 insurers made

over US\$40 billion in cumulative investments in green infrastructure, up from about US\$15 billion in 2008.³⁵ At the 2014 UN Climate Summit, the International Cooperative and Mutual Insurance Federation (ICMIF) pledged to double the industry's investment in green investments to US\$84 billion by end of 2015.³⁶

Chart 2.11

Green Investments by Insurers

Insurers have invested over US\$40 billion in renewable energy



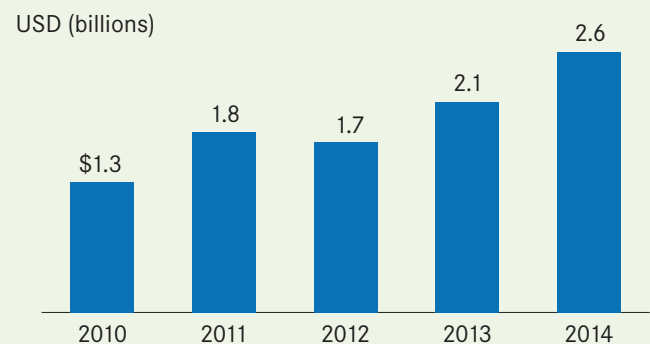
Source: Evan Mills, Green Insurance Data Service.

34 *Fund Management*, TheCityUK, September 2013, p. 6, <http://www.thecityuk.com/assets/Uploads/Fund-Management-2013-F.pdf>.

Chart 2.12

Allianz Cumulative Investments in Renewable Energy Projects

Allianz invested US\$2.6 billion in renewable energy projects in 2014



Note: Figures in USD were converted from EUR.

Source: *Allianz Sustainability Report 2013*, p. 3 (2014, 2013, and 2012 data); *Allianz Sustainability Performance 2011*, p. 11 (2011 data); *Allianz Sustainable Development Report 2010/11*, p. 71 (2010 data).

35 Evan Mills, *Insurers as Partners in Inclusive Green Growth*, November 5, 2013, <http://evanmills.lbl.gov/presentations/Insurers-as-partners-in-inclusive-green-growth.pdf>.

36 "Insurance industry to double its climate-smart investment by end of 2015," International Cooperative and Mutual Insurance Federation, September 24, 2014, <http://www.icmif.org/news/insurance-industry-double-its-climate-smart-investment-end-2015>.

COMPANY PROFILES

The following section features profiles of 12 companies from the S&P Global 100 Index, many of which are also included in the quantitative analysis featured earlier in this report, and includes detailed revenue information, Q&A with leaders of sustainability programs, and examples of products from their portfolios. These companies were selected because of their portfolios of sustainable products and services or because they have otherwise shown themselves to be at the forefront of sustainability innovation.

COMPANY PROFILE

Allianz SE

COMPANY BACKGROUND

Allianz is a global financial services firm headquartered in Germany focused on insurance, both private and commercial, and asset management.

REVENUE FROM GREEN SOLUTIONS

In 2005, Allianz created an overarching climate change strategy which outlines how the company contributes to a low-carbon economy. The strategy consists of three areas: activities as a company, as an investor, and as a financial services provider.

To support its climate change activities as a financial services provider, Allianz offers a Green Solutions portfolio of 156 financial products and services (as of 2014), including insurance and investment products. The portfolio is divided into five thematic clusters: renewable energy, weather, mobility, financial and regulatory risks, and efficiency and resource protection. Inclusion in the portfolio is based upon a rating tool that scores solutions according to three criteria:

- Facilitation of a technology, development, or market that focuses on the climate, environment, and the reduction of clients' exposure to financial and regulatory risks;
- Focus on conservation of the environment and the mitigation of climate change; and
- Protection from environmental risks and help in adapting to climate change impacts through fostering awareness, providing incentive to reduce exposure, and managing the clients' risks.



SECTOR/INDUSTRY
Financials/Insurance

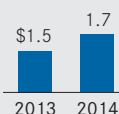
REVENUE (2014)
US\$156B (€122B)

HEADQUARTERS
Munich, Germany

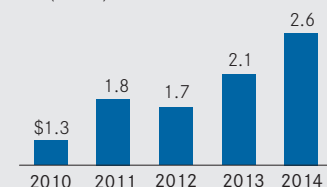
WEBSITE
www.allianz.com

NUMBER OF EMPLOYEES (2014)
147,425

Green Solutions Revenue^a
US\$ (billions)



Cumulative Investments in Renewable Energy Projects^b
US\$ (billions)



Note: Figures in USD were converted from EUR.

Source: a Allianz Sustainability Report 2014, p. 3 (2014, 2013, and 2012 data).

b Allianz Sustainability Performance 2011, p. 11 (2011 data);

Allianz Sustainable Development Report 2010/11, p. 71 (2010 data).

The company's Green Solutions portfolio generated about US\$1.7 billion (€1.3 billion) in revenue in 2014, the second year revenue for the portfolio was communicated, up from US\$1.5 billion (€ 1.2 billion) in 2013.* This represents about 1.1 percent of Allianz's total revenue for 2014.

* All currency equivalents in this company profile were calculated using the yearly average currency exchange rates of the US Internal Revenue Service, <http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates>.

“Allianz also provides its customers with the opportunity to participate actively in climate protection, but the green label alone is not enough. Simply insuring electric cars is not a green service; it is only the special tariff that adds the environmental aspect. Customers expect to benefit on the price and service level because they are buying an environmentally-friendly product with a special insurance cover. However, for many insurance products, this connection is more complicated and harder to communicate to the client. For example, a life insurance client will not necessarily appreciate that the return for their savings contract might fall by 0.2 percentage points simply because the insurer is investing in renewable energy. This means that even if we take innovative, climate-protecting approaches, we remain committed to our three traditional investment principles: return, security, and diversification.”

Maximilian Zimmerer, Member of the Board of Management, Allianz SE

FINANCING SUSTAINABILITY

To support the company’s climate change strategy as an investor, Allianz has made significant direct investments in renewable energy that make it one of the world’s largest investors in wind and solar energy projects. The company’s total direct investments in renewable energy exceeded US\$2.6 billion (€2.0 billion) in November 2014, a doubling of the US\$1.3 billion (€1.0 billion) invested by the end of 2010.

Renewable energy investments by Allianz span across over 50 wind farms and seven solar parks located in France, Germany, Italy, and Sweden. Together, these renewable energy projects generate enough energy (over 1400 megawatts) to meet the annual electricity needs of a city the size of Munich. One of the company’s most recent investments in renewable energy was the acquisition of a 28-megawatt wind farm in France. Allianz also recently invested in a wind farm in Sweden, which will provide energy via a 10-year power purchase agreement with Google to power its data center in Finland with renewable energy.

GOVERNANCE

A board resolution in 2000 established the Allianz Group Sustainable Development Office. Two years later the company started its first socially responsible investment fund, and in 2004 Allianz established its Principles of Sustainable Development which were integrated into the Group Risk Policy and Code of Conduct. These principles

include goals for reaching carbon-free operations, protecting natural resources, and full transparency about sustainability performance.

To carry out these principles today, Allianz has two Sustainability Centers of Competence: the ESG Office and Allianz4Good, which amongst others, develop the sustainability strategy, engage with the community, and manage sustainability reporting. The head of Allianz4Good reports directly to the company’s board member responsible for investments, while the head of the ESG Office reports directly to the board member responsible for third-party asset management and chairman of the ESG board.

In 2005, Allianz launched its first wind park investment which began the company’s foray into renewable energy funding and investments. The following year Allianz began the first iteration of climate change core group activities and founded a center of competence today known as Allianz Climate Solutions. In 2009, the company appointed its first group-level environmental manager, and by the end of the same year Allianz had 50 products in its climate-related portfolio.

In 2012, Allianz established a group ESG board which holds ultimate accountability for ESG (environmental, social, and governance) issues within the company. The ESG Board meets quarterly and reports to the group finance and risk committee for decision-making.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

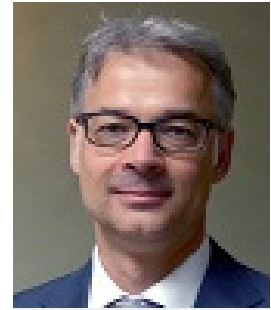
A: It started with a small group of highly motivated and engaged senior managers who believed that climate change can have a business case. The early support of an intrinsically motivated board member as well as a wide network of supports made the initiative what it is today.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: The biggest success is probably the consistent and global growth of green solutions. Over the years, we managed to expand the number of solutions, markets where they are offered, and variety of products. I guess this is what true sustainable success looks like.

Q: What has been the biggest challenge to your sustainable products strategy?

A: The challenge is to transform the “green niche” into a global standard. Customers will not need to choose between green and non-green alternatives. So we



Dr. Thomas Sepp
Deputy Head of Global P&C
Allianz SE

developed a strategy which describes how to integrate the green minimum standard into our standard insurance portfolios worldwide.

Q: What advice would you give to another company going down this path?

A: We are convinced that the status of a niche and its potential can only be leveraged when approaching the topic more strategically. The advice would be: develop a holistic strategy that is aligned with all stakeholders before rolling it out in waves.

Product Examples

In mobility solutions, Allianz offers vehicle insurance in the form of *mileage-based tariffs* that directly links a customer's rates to how often they use their vehicles. Pay-per-use car insurance offers lower rates when customers use their vehicles less frequently or for non-commuting purposes. Allianz also offers *electric or hybrid car tariffs*, which provide lower insurance premiums to policyholders with low-emission cars. Holding an annual public transportation pass also qualifies a customer for a lower-rate tariff. Together, these products incentivize the use of public transportation and low-emission vehicles.

In renewable energy solutions, Allianz offers *renewable energy loans* for renewable energy installations, as well as *renewable energy insurance*.

In efficiency and resource protection solutions, Allianz offers *modernization loans and insurance* that provide coverage for upgrading and rebuilding real estate to modern green building standards after loss or damage. This includes coverage for the construction of solar hot water systems, photovoltaic power cells, and rainwater tanks.

In weather solutions, Allianz offers *weather risk* insurance that covers crops and forest damage in the case of disasters or lack of sun, wind, or water due to extreme deviations from historical data. Due to the increasing volatility of weather and the higher frequencies of natural disasters, these insurance products help mitigate the risks associated with climate change.

COMPANY PROFILE

BASF

COMPANY BACKGROUND

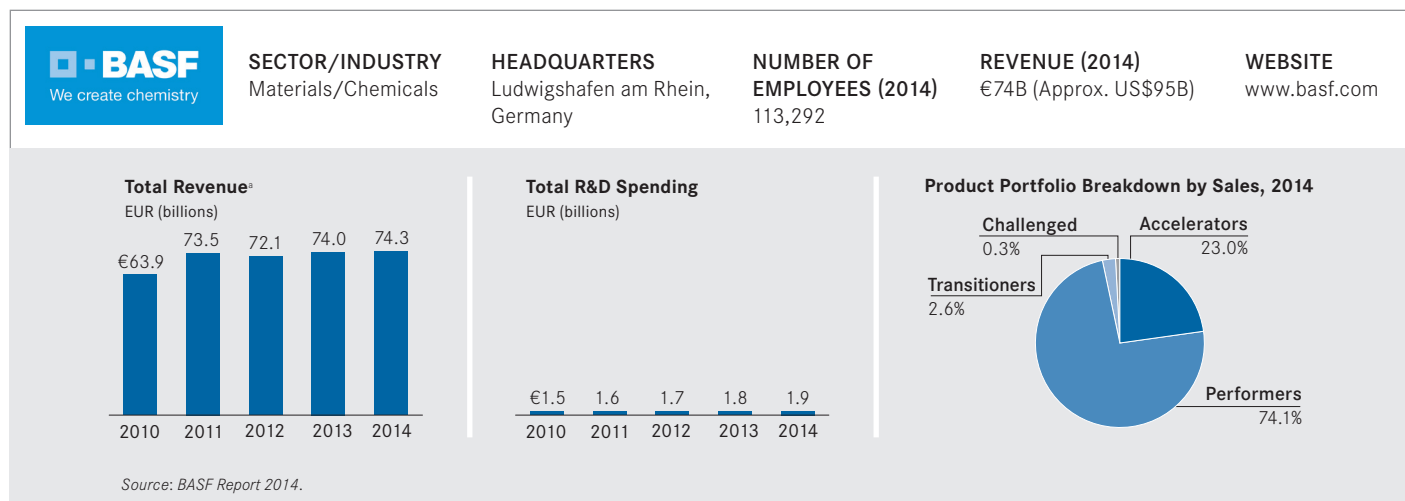
BASF's portfolio ranges from chemicals, plastics, performance products, and crop protection products to oil and gas. A few examples of core products in each segment include the following:

- **Chemicals:** solvents, plastics, and glue
- **Performance products:** chemicals to enhance performance in paper, mining, and water treatment industries
- **Functional materials and solutions:** battery materials, automotive coating, and construction adhesives and paints
- **Agricultural solutions:** herbicides and insecticides
- **Oil and gas:** oil and gas production, primarily in Europe and Russia

REVENUE FROM CLIMATE PROTECTION PRODUCTS

Between 2011 and 2014, BASF conducted sustainability assessments and evaluations on almost the entire portfolio of the company's products to better understand how these products contribute to sustainability. Based on these assessments, BASF categorized products into four groups:

- **Accelerator:** Solutions that contribute particularly to sustainability in the value chain. These products accounted for 23 percent of BASF's relevant sales in 2014, or about €15 billion.
- **Performer:** Solutions that meet all of the market's standard sustainability requirements. These products accounted for 74.1 percent of sales in 2014.
- **Transitioner:** Solutions for which specific sustainability requirements have been identified and plans of action have been defined. These products represented about 2.6 percent of sales.
- **Challenged:** Solutions that do not sufficiently fulfill significant sustainability criteria. Products in this category accounted for 0.3 percent of sales.



“It is more and more important to combine economic success with environmental demands and social responsibility. This approach is an important part of our corporate purpose: ‘We create chemistry for a sustainable future’. We see this as a great business opportunity and an area of cooperation with our customers.”

Margret Suckale, Member of the Board of Executive Directors of BASF SE

R&D SPENDING

BASF’s R&D spending in 2014 amounted to €1.9 billion (approx. US\$2.4 billion). The company allocates about one third of its R&D budget to initiatives related to energy efficiency, climate protection, resource conservation, and renewable raw materials. BASF has identified a number of growth and technology fields for focusing R&D investments, many of which are meant to address global environmental challenges including resource conservation and climate protection. A few examples of these research areas include the following:

- Batteries for mobility, including research to increase the energy density, improve the cost-benefit profile, and increase the lifespan of lithium-ion batteries
- Functional crop care, including research to improve plant growth, better protect seeds, and help plants use scarce resources such as water and nutrients more efficiently
- Raw material change, including research on alternatives and supplements to crude oil as a raw material for the chemical industry
- White biotechnology, including research for creating chemical and biochemical products in an efficient and resource-saving manner

GOVERNANCE

In 2008, BASF appointed the company’s first Climate Protection Officer, with responsibility for coordinating all BASF activities in the area of climate protection products. The Climate Protection Officer is head of the Environment, Health and Safety Competence Center and member of the Corporate Sustainability Board. The role involves coordinating all of BASF’s climate protection activities, from reducing emissions along the entire value chain through to upgrading the climate protection product portfolio.

From 2011 to the end of 2014, BASF conducted sustainability assessments and evaluations on 98.3 percent of its entire portfolio of more than 60,000 specific product applications using the Sustainable Solution Steering™ method. This externally validated procedure allows BASF to determine how the company’s products contribute to sustainability. BASF observes their application in various markets and industries. BASF has engaged over 2,000 experts in the areas of R&D, product safety, sales, marketing, and sustainability.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: For 150 years, BASF has been creating chemistry to find new and better solutions for its customers. Following its corporate purpose statement, “We create chemistry for a sustainable future,” BASF is focusing on chemical innovations that help customers contribute to sustainability. To meet customer needs even better in the future and to secure long-term business success, BASF has set itself the target to further increase its share of sustainable solutions. As a basis, BASF has analyzed and evaluated the sustainability aspects of its entire product portfolio and established a new process for steering its portfolio based on sustainability criteria. Already in 2014, 23 percent of our global sales are generated by innovative products and solutions with a significant contribution to sustainability in their application.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: With our broad portfolio of innovative products, we are in a position to address global megatrends. Our products and solutions contribute to conserving resources, ensuring nutrition, and improving quality of life. Our portfolio has always included solutions and technologies that contribute to sustainability such as insulation materials for buildings, lightweight plastics for fuel-saving cars, and many others. By systematically identifying key drivers for sustainability in our own industry as well as in our customers’ sectors, we will further enhance this contribution. Looking out for more sustainable solutions means both exploring new market opportunities and minimizing risks at the same time.

Q: What has been the biggest challenge to your sustainable products strategy?

A: In meeting the new sustainability challenges BASF faces, we can draw on decades of experience improving environmental standards in our various operations. For example, in the 1980s and 1990s, the chemical industry focused mainly on production processes and the reduction of emissions and waste. (For example,



Dirk Voeste
Vice President of
Sustainability Strategy
BASF

emissions of nitrogen to water were reduced by nearly 90 percent, with about 17 million MWh energy saved per year through the Verbund production process). We have also achieved a high level of operational excellence in terms of safety, optimized operations, and effective processes. We have put in place continuous improvement programs to maintain this leading position because high sustainability standards are essential for BASF’s license to operate and as a basis for resource and cost-efficient production.

Q: What advice would you give to another company going down this path?

A: Companies can start with looking at the three dimensions of sustainability: balancing economic needs, environmental protection, and social impact, starting in their own operations and then moving into their customer base as well as their supply chain. With regard to the environment, companies must look at their operations including emissions and energy consumption but also at their supply chain and the impact of their products downstream. With regard to the social impact of business, companies should start off with building a strong relationship with their employees and stakeholders. As they need to run a profitable business, it is important to integrate sustainability into the business right from the beginning. Building a strong network within the company is important to drive the change.

Product Examples



Keropur[®] is a brand of fuel additives that reduces fuel consumption and premature engine wear when added to the fuel supply. It also reduces pollutant emissions by 20 percent and increases fuel economy by 2 percent. Keropur[®] is an example of climate protection additives in BASF's mobility sector.

N₂O decomposition catalyst Nitrous oxide is a particularly potent greenhouse gas that is released as a byproduct of various chemical processes, including those produced by BASF's clients. To reduce nitrous oxide emissions, BASF created a N₂O decomposition catalyst which converts nitrous oxide into harmless nitrogen and oxygen. The catalyst does this by using nitrous oxide as an oxidizing agent.



Epoxy resins BASF developed new epoxy resins for wind turbine rotor blades which increases the performance of the blades and ensures no defects even when manufacturing large blades in bulk. BASF's epoxy resins have the advantage of allowing 30 percent shorter production times, which effectively increases the economic efficiency of wind power.



Synthetic sodium nitrate An example of a BASF Accelerator product is synthetic sodium nitrate, which is used as a heat transfer medium in solar thermal power plants. This product is used instead of thermal oils to increase the operating temperature and electricity yield of these power plants.

Pictures credits: BASF

COMPANY PROFILE

Caterpillar Inc.

COMPANY BACKGROUND


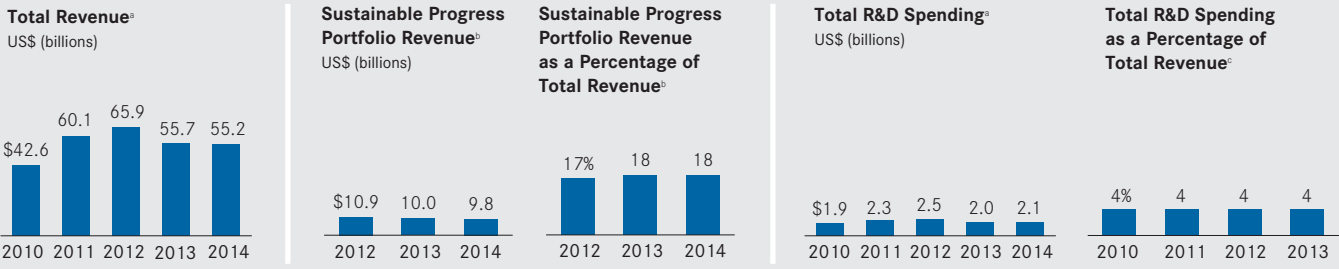
With 2014 sales and revenues of \$55.184 billion, Caterpillar is the world’s leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives. The company principally operates through its three product segments— Construction Industries, Resource Industries and Energy & Transportation—and also provides financing and related services through its Financial Products segment.

SALES AND REVENUES FROM MORE SUSTAINABLE PRODUCTS AND SERVICES

Caterpillar has multiple products, services and solutions that have demonstrated improved sustainability benefits over existing offerings. This includes remanufacturing, component overhauls at Cat® dealers, power generation using alternative energy sources, customer job site

optimization and innovative new products. The company’s remanufacturing business takes back over 165 million pounds of end-of-life material from customers annually and remanufactures them into same-as-new condition. Caterpillar’s power generation systems offer combined heat and power configurations and systems that utilize alternative fuels such as landfill gas and biogas. Caterpillar has also developed breakthrough technology such as hydraulic hybrids and diesel/electric drives that dramatically improve fuel efficiency and lower emissions, as well as offers services that integrate state of the art sensing, monitoring, and communication technology to optimize customer productivity and efficiency and minimize jobsite energy and resource usage for customers.

Caterpillar’s portfolio of sustainable products generated almost US\$10 billion in 2014, accounting for 18 percent of the company’s total sales and revenues.

	SECTOR/INDUSTRY Industrials/Machinery	HEADQUARTERS Peoria, IL, USA	NUMBER OF EMPLOYEES (2014) 114,233	REVENUE (2014) US\$55B	WEBSITE www.caterpillar.com
					

Source: a *Caterpillar 2014 Year in Review*, p. 50, <http://s7d2.scene7.com/is/content/Caterpillar/C10428589>.
 b Caterpillar email communications to The Conference Board, November 24, 2014 and April 8, 2015. Caterpillar’s 2012 figures are the company’s unreported estimates and were not verified through auditing protocol, unlike figures for more recent years.
 c Figures were calculated by The Conference Board with data from Caterpillar annual reports.

“I’m very pleased to announce that in early 2014, we added Sustainability to Our Values in Action, clearly stating our responsibility to produce sustainable solutions. Raising sustainability to a stand-alone value acknowledges both what we have done in the past and will do in the future.”

Doug Oberhelman, Chairman and CEO, Caterpillar

R&D SPENDING

In 2014 Caterpillar spent US\$2.1 billion on R&D. As a ratio of total revenue, R&D spending has remained constant at about four percent of total revenue. Research and development expense is expected to increase about 10 percent in 2015.

Sustainability is considered in the product development process. The company’s technology strategy establishes the foundation of its innovation, including four themes — Energy and Transportation, Machine and Machine Systems, Automation and Enterprise Solutions, and Factory Technology Solutions. Each theme includes customer-focused goals that serve as targets against which progress can be measured. Examples include:

- Energy efficiency and emissions reductions from engines, drive trains, and mechanical components
- Hybrid hydraulic technology to reduce fuel consumption and emissions from excavators and other products with hydraulic components
- Next generation powertrains to allow use of alternative energy sources such as biofuels, waste gases, or biogases

GOVERNANCE

In 2014, Caterpillar amended its code of conduct to elevate sustainability as a core value. The company’s “Values in Action” defines what Caterpillar stands for and believes in, documenting its ethical standards.

Caterpillar applies innovation and technology to improve the sustainability performance of the company’s products, services, solutions, and operations. The company believes sustainable progress is made possible by developing better systems that maximize life cycle benefits, while also minimizing the economic, social and environmental costs of ownership.

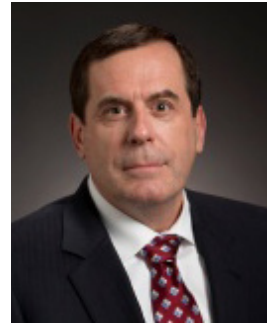
In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: To help our customers operate more sustainably and enable sustainable progress by providing solutions that support infrastructure and energy development, improve communities, and protect the planet. Sustainability is more than important things that we do at Caterpillar—it is part of who we are. It is now built into our employee code of conduct as one of our five core values (Integrity, Commitment, Excellence, Teamwork, and Sustainability). As such, sustainability is considered in every important project discussion and decision.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: For more than 40 years, Caterpillar's remanufactured and rebuilt products have provided same-as-new performance, reliability, and warranty at fraction-of-new costs, as well as availability that gives customers more options at repair and overhaul time. Caterpillar Reman, the remanufacturing business of the company, operates facilities in eight countries. Over 7,000 parts are remanufactured, including engines and components, turbines and generators, hydraulic components, transmissions, and electronics.



Tim Lindsey
Global Director of Sustainability
Caterpillar

Considerable sustainability benefits are achieved through remanufacturing compared to producing new components. For example, the remanufacturing of an engine cylinder head requires 86 percent less water use and 85 less energy use than producing a new component.

Q: What has been the biggest challenge to your sustainable products strategy?

A: Fully embedding it into existing processes and procedures.

Q: What advice would you give to another company going down this path?

A: Unleash the talents and passion of employees to develop, prove, and implement sustainability innovations.

Product Examples



Cat® 336E H Hybrids usually pair conventional fuel with electricity, but with construction and mining machines, electric hybrids have been uneconomical. First revealed by Caterpillar’s excavation division in October 2012, the Cat 336E H is Caterpillar’s first hydraulic hybrid excavator. Instead of losing energy to friction as a result of braking, it uses a hydraulic-based regenerative braking system to capture energy from the hydraulic oil flow produced by the swing motor. It stores this energy in high-pressure accumulators and uses it to help drive the swing motor during swing acceleration. Since fuel makes up a large proportion of excavator operating costs, the 25 percent fuel efficiency gain of the hybrid model over the standard 336E model greatly decreases operating costs as well as emissions and noise pollution—all without compromising performance. Caterpillar estimates that customers can see a return on investment in as little as one year.



Cat® 966K XE Loader This product delivers 25 percent higher fuel efficiency than its predecessor by combining mechanical transmission with a new hydrostatic transmission that recycles energy lost during deceleration and reduces soot and other emissions. In addition to the environmental benefits, the Cat 966K XE Loader can be remote controlled to reduce injuries in hazardous work environments.



Cat® CHP Systems Caterpillar produces a wide range of innovative distributed power generation systems in “combined heat and power” (CHP) configurations. The combined heat and power systems are up to twice the efficiency of conventional power grids. These systems are often powered by diverse fuel sources ranging from natural gas; biogas generated from landfills, livestock operations, and wastewater treatment plants; biofuels; and waste gases, such as mine methane and flare gas from oil production and refining.



Cat® Product Link® Caterpillar product development teams have placed considerable emphasis on optimizing electronic architecture to improve efficiency, reliability, and serviceability associated with automation, systems integration, prognostics, and diagnostics. Caterpillar continues to develop its Product Link suite of hardware offerings. These technologies help customers improve efficiency and productivity by helping them optimize fleet performance and enable operators to grade sites with fewer passes. Examples of these innovations include Cat® AccuGrade™, Compaction Control, Grade Control, and Payload Control. These innovations have demonstrated reduced jobsite fuel consumption and greenhouse gas emissions by 25–30 percent. These systems use electronic hardware and software integrated into each machine to provide linkage and communication back to a central coordinating office. The central office is then able to monitor the health of all equipment as well as optimize routing and dispatch. Caterpillar uses data collected by these systems to better understand how its machines are being operated and to become even more proactive in identifying and responding to machine performance issues.



Caterpillar Job Site Solutions Caterpillar has developed a solutions-focused business model for delivering value to customers. Designed and delivered by the Caterpillar Job Site Solutions (JSS) team in partnership with Cat® dealers, solutions help customers find new and innovative ways to improve their operations and be more competitive in the marketplace. JSS leverages Caterpillar’s financial, technological, application and management expertise to tailor solutions based on the customer’s own needs, typically in the areas of safety, sustainability, equipment, productivity and financials. As a result, every solution is different, scalable, and can range from a short-term consulting engagement to a multiyear fleet ownership and maintenance solution. JSS customers have seen a 32 percent improvement in fuel efficiency, eight percent reduction in fleet size, and 23 percent increase in production efficiency.

COMPANY PROFILE

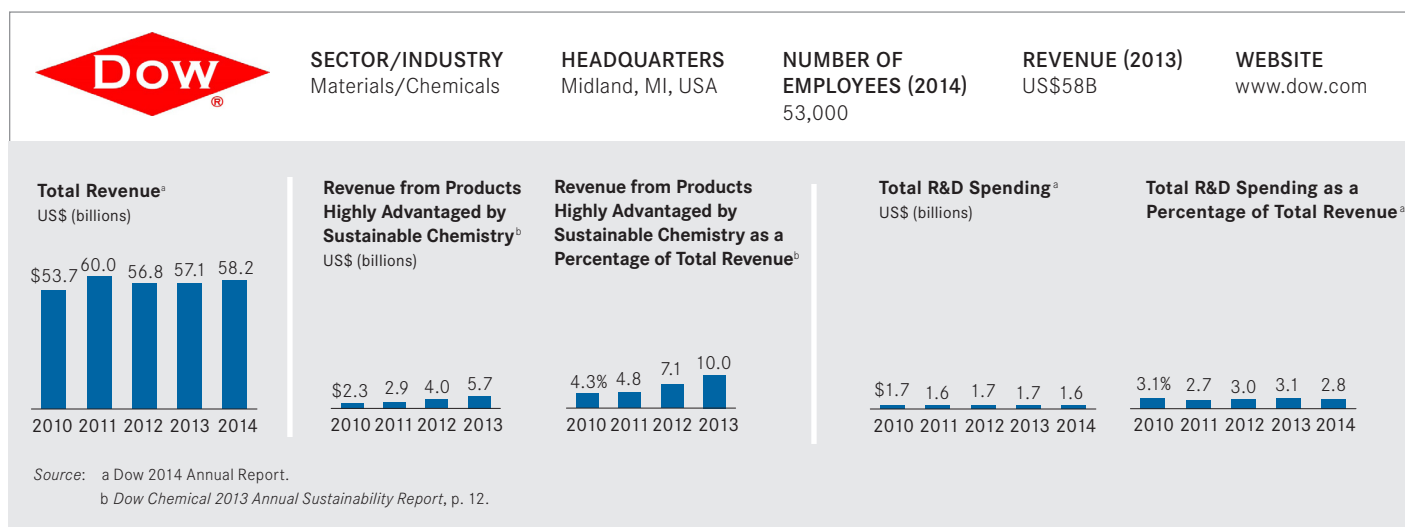
Dow Chemical Co.

COMPANY BACKGROUND

Dow's portfolio of specialty chemical, advanced materials, agrosiences, and plastics businesses delivers a broad range of technology-based products and solutions to customers in approximately 180 countries and in high-growth sectors such as packaging, electronics, water, coatings, and agriculture. In 2014, Dow had annual sales of more than US\$58 billion and employed approximately 53,000 people worldwide. The company's more than 6,000 products are manufactured at 201 sites in 35 countries across the globe.

REVENUE FROM PRODUCTS HIGHLY ADVANTAGED BY SUSTAINABLE CHEMISTRY

Dow tracks revenue from a portfolio of products that are highly advantaged by sustainable chemistry, as measured by the company's Sustainable Chemistry Index (SCI). These products not only have lower emissions than the products they replace but are also screened for energy use, safety of production, renewability of material, and value added to society. Annual revenues from these products reached US\$5.7 billion in 2013, a 42 percent increase over the revenues of 2010. From 2010 to 2013, total company revenues grew by 6 percent. Dow's portfolio of products highly advantaged by sustainable chemistry accounted for 10 percent of total revenues in 2013, up from 4 percent in 2010. Key drivers of success have been related to improved manufacturing efficiency and to the realization of product sustainability opportunities in the areas of food, agriculture, water, automotive, infrastructure, energy, and consumer products.



“One of the greatest benefits of this effort was the exponential increase in sustainability awareness it generated among our employees. As a result of using the Sustainable Chemistry Index, Dow people across the company are having dialogues about sustainability that are helping to inform the decisions we make every day about everything from innovation to marketing to manufacturing.”

Neil Hawkins, Corporate Vice President and Chief Sustainability Officer, The Dow Chemical Company

R&D SPENDING

In 2014, Dow spent US\$1.6 billion on R&D or about 3 percent of total revenue. This share has remained mostly consistent since 2010.

R&D investments target market needs through close value chain engagement and continuous optimization of the innovation portfolio. Dow delivers differentiated innovations through a narrow focus on key market segments aligned to both the company’s strategy and global challenges. The company’s innovation portfolio is centered on delivering solutions that are more efficient during production and throughout the product life cycle. Areas where Dow products are creating impact include ensuring sustainable food and water supplies, mitigating climate change, and improving housing conditions and personal health and safety. Research areas include:

- Reverse osmosis to tackle water supply;
- “Lightweighting” (or reducing vehicle weight) to increase safety and fuel efficiency with structural adhesives that bind plastic to metal with hybrid polymers; and
- Advanced agricultural products to improve nutrition through reducing trans and saturated fat in consumer diets.

GOVERNANCE

Dow’s sustainability strategy is driven by its 2015 sustainability goals, the company’s second series of decade-long goals established in 2006 (following its initial set of 2005 EH&S goals set in 1995). One of the seven goals is to achieve a target of 10 percent of total revenues from products that are highly advantaged by sustainable chemistry by 2015, as measured by the company’s Sustainable Chemistry Index (SCI). The company reached this target in 2013, two years ahead of schedule. This focus on sustainable chemistry emerged from external stakeholder input as well as alignment to capabilities of the company; further external stakeholder input refined and enhanced the approach resulting in the sustainable chemistry program, including the development of the SCI.

Another of Dow’s 2015 goals focused on delivering three “Breakthrough to World Challenges,” defined as major advancements over current technology or business practices that will deliver a positive impact to millions and significantly help solve global challenges in the areas of energy and climate change, water, food, housing, and health. Dow cites the United Nation’s Millennium Development Goals as the company’s primary influence for setting these focus areas for their research. Dow exceeded its “Breakthrough” goal in 2014.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: Our focus on sustainable chemistry came at the recommendation of external stakeholders, including our Sustainability External Advisory Council (SEAC). The SEAC encouraged the company to focus on not just minimizing its footprint but also on delivering products that help address the global sustainability challenges facing society.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: Dow's biggest success has been integrating a sustainability mindset across the company—serving a broad range of markets and sectors and working to continually innovate and deliver more sustainable solutions. Opportunities to improve the sustainable chemistry profile are plentiful, allowing everyone to contribute.

Q: What has been the biggest challenge to your sustainable products strategy?

A: Dow settled on a standardized assessment in developing its Sustainable Chemistry Index, but given the diversity of products and technologies in the



Anne Wallin
Director of Sustainable Chemistry
Dow Chemical

Company's portfolio, this has resulted in some areas or questions playing a lesser role. Sustainability is an incredibly broad topic, and the Dow technology portfolio is equally broad; sometimes the question is not as important as the overarching objective, which is assessing sustainability overall.

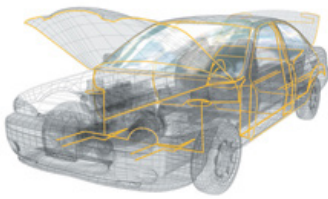
Q: What advice would you give to another company going down this path?

A: It is critical to have broad, extensive stakeholder input before beginning any sustainability program, as this input can help identify key opportunities. Focusing on these relevant, meaningful opportunities can help an organization deliver real improvement for itself and its stakeholders.

Product Examples



FILMTEC™ ECO Reverse Osmosis Dow named its second “Breakthrough to World Challenges” technology, FILMTEC™ ECO Reverse Osmosis (RO) Elements, in March 2014 (the company’s first “Breakthrough” technology was Omega-9 Oils, announced in 2012). Developed by Dow Water & Process Solutions, this technology for industrial operations helps combat global scarcity by delivering 40 percent better water purification with 30 percent less energy compared to current best-in-class water purification membranes—one of the most significant advancements in this area in the last 30 years. Dow estimates that use of these elements will help eliminate 1.5 million tons of carbon dioxide (CO₂) emissions and two billion kilowatt-watt hours (kWh) of energy use in the first 10 years of use alone, all while delivering over 15 trillion cubic meters of clean water.



BETAMATE™ Structural Adhesives In September 2014, BETAMATE™ Structural Adhesives, which help lightweight vehicles by bonding dissimilar materials such as metal and plastic, were named Dow’s third “Breakthrough” technology. Benefits include emissions avoidance and gasoline savings through higher fuel efficiency in addition to increased crash safety and vehicle life span. While only the latest generation of structural adhesives have been called a breakthrough, the product line has existed since 1999 and has contributed to over 23 billion kilograms of CO₂ avoidance and 2.65 billion gallons of gasoline savings since then.



Dow’s **100 percent Polyethylene Recyclable* Stand Up Pouch** is manufactured with only one material, polyethylene, making it easier to recycle, and can be used in a variety of markets including beverages, cosmetics, dry and frozen foods, and cleaning products. The Stand Up Pouch offers up to 88 percent less total material weight, consumes 54 percent less total energy, and allows for up to 90 percent less post-consumer solid waste when compared to a bag-in-box cake mix.†

* Manufactured using only polyethylene resins in its structure enables recyclability in communities with existing PE recycle streams.

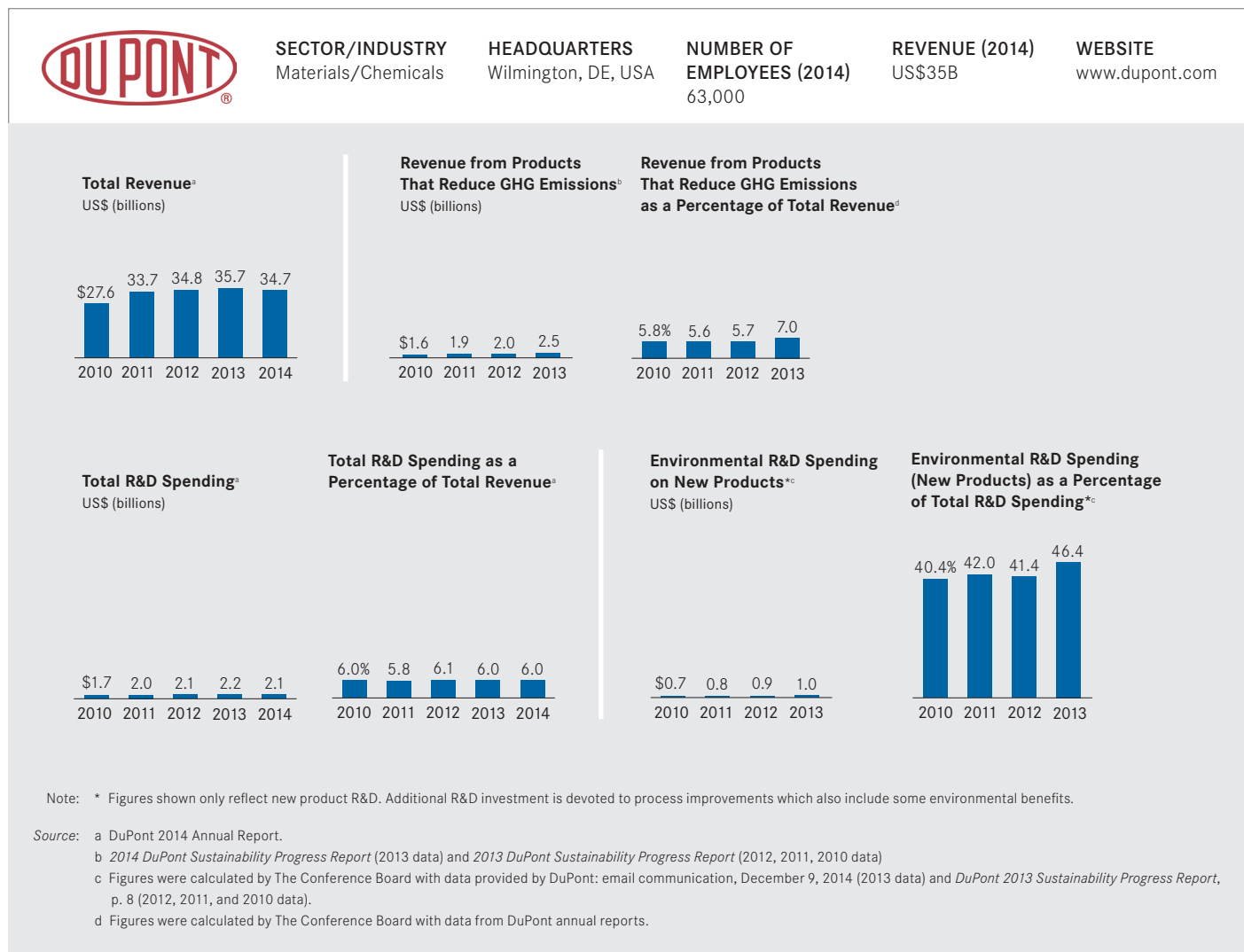
† Source: LCA Analysis via Calculess™ Environment Impact Analyzer.

COMPANY PROFILE

E. I. du Pont de Nemours and Company

COMPANY BACKGROUND

DuPont is a multinational science company headquartered in the United States. The company operates 12 business units and serves markets as diverse as agriculture, nutrition, electronics and communications, safety and protection, home and construction, transportation, and apparel.



“At DuPont, our sustainability journey has evolved over the last few decades. We began by responding proactively to calls for environmental compliance and by reducing our operational footprint. Since the early 2000s, we’ve expanded our sustainability efforts into market-driven goals that have helped us produce more sustainable solutions for customers.”

Linda J. Fisher, Vice President of Safety, Health & Environment and Chief Sustainability Officer, DuPont

REVENUE FROM PRODUCTS AND SERVICES WITH INCREASED SUSTAINABILITY BENEFITS

In 2006 DuPont set four market-facing sustainability goals to be achieved by 2015:

- 1 to increase annual revenue by at least US\$2 billion from products that reduce greenhouse gas emissions for customers or the final consumer (defined as products that increase energy efficiency or significantly reduce greenhouse gas emissions);
- 2 to double revenue from nondepletable resources to US\$8 billion;
- 3 to introduce at least 1000 products that protect people; and
- 4 to double investment in R&D programs with direct quantifiable environment benefits for customers or consumers.

These goals were successfully met and surpassed by 2012. Additionally, in early 2012 DuPont set goals for 2020 that include food security and energy as the primary focus.

By the end of 2013, products that help reduce GHG emissions and/or improve energy efficiency generated US\$2.5 billion in annual revenue for DuPont. That increase represents a 56 percent growth over annual revenue in 2010. From 2010 to 2013, the company’s overall revenue grew by 13 percent. Products that help DuPont customers or end-use consumers reduce GHGs and/or improve energy efficiency accounted for seven percent of DuPont’s total revenues in 2013, up from five percent in 2010. A key driver of success has been an increased expectation for improved energy efficiency and consideration of GHG impacts in many of the markets that DuPont serves. These products enabled cumulative reductions of 45.7 million

metric tons CO₂-e (2007–2013) and continue to deliver ongoing GHG and energy efficiency improvements in the products’ use phase.

ENVIRONMENTAL R&D SPENDING

In 2013 DuPont spent US\$1 billion on R&D for development of new products that have a quantifiable environmental benefit for customers or consumers, an increase of 50 percent from the US\$0.66 billion allocated in 2010. Environmental R&D accounted for 46 percent of total R&D in 2013, up from 40 percent in 2010. These figures for environmental R&D investment only reflect new product R&D. Additional R&D investment is devoted to process improvements which include some environmental benefits not included above. Future environmental R&D investments will be targeted to advancing research in:

- Agriculture and nutrition, to increase food security through preventing climate change effects on crops such as increased erosion and temperature fluctuations;
- Advanced materials, to create more efficient photovoltaic modules and weather-resistant films that protect photovoltaic fuel cells; and
- Industrial biotechnology, to increase production of ethanol and other alternative biofuels.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: Sustainability has been a journey at DuPont (see below). We began the journey in the 1970s with our first environmental policy statement to be “In Compliance with all Laws and Regulations.” In 1989, DuPont announced operational footprint and energy goals. 2006 marked an ambitious announcement of market-facing goals focused on developing products with increased sustainability benefits. DuPont is committed to helping our customers find solutions to some of the world’s most pressing needs using a model of sustainable growth as our guide. Our goals, therefore, have been developed and informed with customer, value chain, and global needs in mind.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: Solar energy is the most abundant energy resource on earth—173,000 terawatts of solar energy strike the Earth continuously. That’s more than 10,000 times the world’s total energy use. Bringing innovations to market that harness that power is essential. DuPont has been at the forefront of solar innovation. Beginning in the 1950’s, DuPont provided the first purified silicon for the Bell Labs experiment demonstrating the first solar cell.



Linda Fisher
Chief Sustainability Officer
DuPont

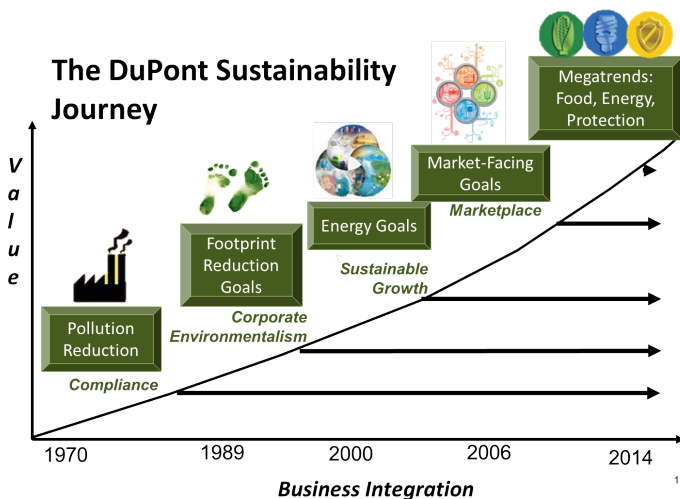
Today, DuPont is the leading supplier of specialty materials with the largest portfolio of products designed to boost the power output and reliable lifetime of solar panels, lowering overall system costs and improving system investment returns for solar.

Q: What has been the biggest challenge to your sustainable products strategy?

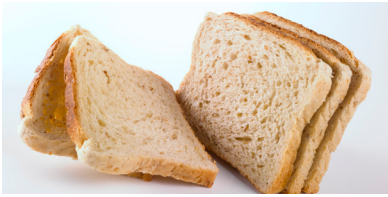
A: Products with increased sustainability benefits are generally newer additions to our product portfolio and in the earlier stages of their product life cycles. As such, these products have not experienced the cost benefits that come from long-term manufacturing and efficiencies gained over time. Our value chains are demanding products with enhanced sustainability benefits but want these newer, more sustainable products to be priced competitively with the incumbent products. Thus, we must develop effective value propositions for these new products.

Q: What advice would you give to another company going down this path?

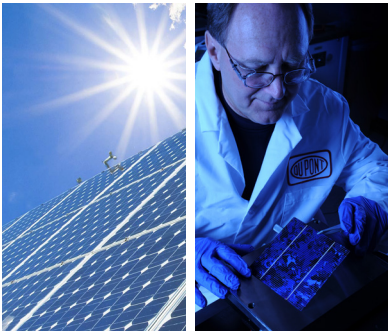
A: Sustainability is a journey and reflects the dynamic nature of both a company and the larger societal and environmental context in which it operates. Engaging key stakeholders—customers, investors, suppliers, and employees—is critical to developing the road map and defining success for a sustainability strategy. Setting ambitious goals provides context, focus, and organizational excitement for a company’s sustainability strategy and success.



Product Examples



POWERFresh™ enzymes, created by DuPont's industrial biosciences and nutrition & health businesses, increase and maintain the freshness of bakery products to reduce avoidable food waste in the food value chain and by consumers. Food waste is the largest contributor to municipal solid waste, and more than 30 percent of bakery goods are discarded before consumption. One kilogram of POWERFresh™ enzymes can prevent hundreds of kilograms of carbon dioxide equivalent emissions and also increase customer loyalty for bakeries.



Solamet® Photovoltaic Metallization Pastes To boost the power output of solar panels by improving the conversion efficiency of solar cells, DuPont microcircuit materials developed Solamet® photovoltaic metallization pastes. This product line has seen continual R&D investment and key innovations that are helping to make clean and sustainable solar energy increasingly more cost-competitive with fossil fuels.



DuPont Biofuel Solutions Despite the well-documented economic and environmental benefits of expanded biofuels production, some critics have alleged that increased ethanol production is diverting grain from food and feed markets and leading to higher retail food prices. To make biofuels more sustainable in more geographies, DuPont has focused on making cellulosic ethanol, a second and third generation biofuel that uses non-food feed, such as agricultural residues like corn stover and sugarcane straw. The potential yield is more than six billion gallons of ethanol per year in the United States alone. DuPont has already involved over 285 farmers in the collection of corn stover feedstock.

COMPANY PROFILE

General Electric

COMPANY BACKGROUND

General Electric (“GE”) is a globally diversified technology company. GE’s hardware, software, and services span a wide array of industries, from industrial offerings for oil & gas, power generation, water treatment, and locomotive propulsion systems to healthcare infrastructure and lighting.

A COMMITMENT FOR MORE SUSTAINABLE BUSINESS

In 2005, GE launched EcomaginationSM—the company’s commitment to technology solutions that improve business performance and manage environmental impact, for

both its customers as well as GE’s own operations. In the first generation, GE set several challenging goals, including the following:

- Double annual cleaner R&D investment to US\$1.5B by 2010
- Grow EcomaginationSM-related revenues to US\$20B and at twice the rate of GE’s overall industrial revenue
- Reduce carbon emissions from its own operations by 1 percent by 2012
- Reduce freshwater use from its own operations by 20 percent by 2012

	SECTOR/INDUSTRY Industrials/Industrial Conglomerates	HEADQUARTERS Fairfield, CT, USA	NUMBER OF EMPLOYEES (2014) 305,000	REVENUE (2014) US\$149B	WEBSITE www.ge.com
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Industrial Segment Revenue^a
US\$ (billions)

Year	2010	2011	2012	2013	2014
Revenue (US\$ billions)	85.2	95.2	102.8	103.6	109.9

EcomaginationSM Revenue^b
US\$ (billions)

Year	2010	2011	2012	2013	2014
Revenue (US\$ billions)	18.2	21.4	25.8	30.6	33.9

EcomaginationSM Revenue as a Percentage of Total Industrial Segment Revenue^b

Year	2010	2011	2012	2013	2014
Percentage	21%	22%	25%	30%	31%

Total R&D (GE Funded)^a
US\$ (billions)

Year	2010	2011	2012	2013	2014
R&D (US\$ billions)	3.9	4.6	4.5	4.6	4.2

EcomaginationSM R&D^b
US\$ (billions)

Year	2010	2011	2012	2013	2014
R&D (US\$ billions)	1.8	2.3	1.7	1.8	2.3

EcomaginationSM R&D as a Percentage of Total R&D^b

Year	2010	2011	2012	2013	2014
Percentage	46%	50%	38%	39%	54%

Sources:

a GE 2014 Annual Report and GE 2013 Annual Report.

b Figures were calculated by The Conference Board with data provided by GE: 2014, 2013, and 2012 data: GE email communication to The Conference Board, April 20, 2015.

2011 data: GE EcomaginationSM Report 2011, http://files.gecompany.com/ecomagination/progress/GE_ecomagination_2011AnnualReport.pdf.

2010 data: GE EcomaginationSM Report 2010, http://files.gecompany.com/ecomagination/progress/GE_ecomagination_2010AnnualReport.pdf.

“EcomaginationSM is one of our most successful cross-company business initiatives. Bold investments in EcomaginationSM research and development have resulted in strong returns for shareholders and improved cost and emissions savings for our customers.”

Jeff Immelt, Chairman and CEO of GE

STRATEGY

GE’s EcomaginationSM initiative was launched by CEO Jeff Immelt after recognizing that many of GE’s core businesses were closely tied to an increasing demand for energy and water in the face of both a growing population and a dramatic increase in global wealth and that more sustainable solutions would be needed to help customers grow and compete in the future.

GE, with its diverse set of industrial holdings, is positioned uniquely to innovate from a company-wide strategy that catalyzes change to accelerate new technology solutions, business models, and partnerships that shape solutions that not only deliver better business results through increased resource productivity and reduced consumption but are also better for the environment.

To achieve globally impactful results, leadership is relentlessly focused on developing and delivering solutions that customers need. Over the past decade, four key areas have proved critical to GE’s success:

- **Clear market and stakeholder focus** Regular engagement with key stakeholders, including customers and partners, is critical to ensuring strategy is relevant to local and global markets. For GE EcomaginationSM, this includes regular guidance from the EcomaginationSM advisory board, comprised of eight global thought leaders with deep expertise in business, energy & water markets, policy and the environment.
- **Public commitments** Tangible goals are key to mobilizing and keeping teams engaged, focused, and accountable to driving clearly articulated outcomes.
- **Senior leadership engagement** CEO support has been key to GE Ecomagination’s success by shaping key priorities and providing advocacy and resources over the short and longer term.
- **Collaboration** EcomaginationSM strategy is centrally led; however, leaders within each major business line at GE

align initiatives to the strategy as do leaders within GE’s global research, ventures, and environmental health and safety organizations. Externally-focused collaboration has also been a key hallmark of the program and an important element driving successful outcomes. For example, the company’s series of Open Innovation challenges convene experts across the world to solve tough challenges through the identification of new markets and applications as well as specific hardware and software innovations.

As a result, over the last decade, GE has been able to improve resource productivity and environmental performance of core products including gas turbines, aircraft engines, locomotives, and beyond. In addition, GE has advanced new technologies including wind turbines, LED lighting systems, and hybrid solid oxide fuel cells. The company has utilized advanced manufacturing principles and the Industrial Internet (a term coined by GE to describe the integration of complex physical machinery with networked sensors and software) to further improve resource efficiencies at a scale that is unique to GE.

PROGRESS

MARKET-FACING GOALS: R&D AND REVENUE

GE has invested over US\$15 billion in EcomaginationSM R&D. In 2014 alone, GE spent more than US\$2 billion on EcomaginationSM R&D, representing approximately half of GE’s total R&D spend. Investments in EcomaginationSM have generated US\$200 billion in revenue for GE cumulatively since the initiative’s launch, resulting in a growth rate of 4x the rate of its overall industrial business. In 2014, annual revenue from EcomaginationSM totaled US\$34 billion, an 86 percent increase over revenues in 2010.

EcomaginationSM solutions rank among the most efficient in the world in their respective categories. The portfolio is reviewed to ensure the operational and environmental performance of technologies and confirm that products

and processes continue to represent solutions that are advancing meaningful resource productivity improvements in the marketplace.

For example, GE has over 25,000 wind turbines installed across 31 countries today. Wind solutions have been a key technology since EcomaginationSM's launch in 2005, but the technology has evolved substantially over time. Ten years ago, innovation was focused on the wind turbine itself; today's wind solution is transformed to a "Brilliant Wind" platform with an integrated system of hardware, battery, sensors, and software to help maximize clean energy production at the wind farm level.

New business models are increasingly in demand as a significant innovation lever to develop and unlock new markets. The evolution of the GE Energy Ventures program is positioned to create new business ecosystems and accelerate the adoption of new technologies. Recently, GE in collaboration with Statoil and Ferus Natural Gas, tackled the big challenge of flare gas in the US. By creating new technologies to capture, monetize, and use flare gas, along with the novel innovation of creating new transportation and logistics networks, diesel fuel can now be displaced for field operations on remote wells. The first commercial application of GE's "Last Mile Fueling solution" is currently at work with Statoil at a site in North Dakota.

GE EcomaginationSM also recognizes a need to be an early leader in the development of nascent and potentially game-changing markets. In 2010, with the emergence of viable new alternative-transportation vehicles, GE not only invested in the development of new fueling networks—both electric and natural gas—to support these vehicles but also actively participated in getting this market off the ground by announcing a commitment to acquire 25,000 alternative fuel vehicles for both GE as well as on behalf of GE's customers and drive early scale. Five years and some 25,000 vehicles later, the industry continues to make positive progress as lower cost, higher performance next-generation vehicles enter the market, and fueling networks become increasingly robust. GE itself has over 6,000 alternative fuel vehicles in their corporate fleet today.

INTERNAL: GE FOOTPRINT

Through 2014, GE has reduced GHG emissions by 31 percent (from the 2004 baseline) and freshwater use by 42 percent (from the 2006 baseline).

One critical initiative that has been key to success has been the creation of the EcomaginationSM "Treasure Hunt" program. A Treasure Hunt is an energy and water-focused process leveraged from lean manufacturing, modeled after the best practices of the Toyota Kaizen process, and designed to identify projects and opportunities to reduce resource waste in a facility. Treasure Hunts have also built a foundation for ongoing monitoring, management, and innovation. This has allowed the teams to create standardized processes and approaches to apply across GE's global operations. This approach, along with a number of other initiatives, has enabled GE to not only achieve its internal footprint goals but has saved the company more than US\$350 million in energy costs over 10 years. Thousands of employees globally have been trained to scale these efforts, and today GE's experts consult with customers to identify and achieve these benefits in their own operations.

LOOKING AHEAD

In 2014, GE renewed its EcomaginationSM commitment by announcing an incremental US\$10 billion in cleaner technology and development by 2020—bringing Ecomagination's total cumulative investment to US\$25 billion.

The EcomaginationSM framework will focus on six key areas GE believes are critical to a sustainable global economy:

- Development of new natural gas ecosystems for the oil and gas, power generation, and transportation industries
- Deployment of next generation renewables that are both lower cost and better integrated into larger power networks;
- Increased efficiency and alternative fuels for global transportation networks
- Improved industrial and commercial water reuse and productivity
- Increased resource productivity through the deployment of smart machine-to-machine software and analytics
- More optimal, integrated systems at the home, building, and municipal levels

GE has also made additional commitments to reduce GHG emissions and freshwater use by 20 percent from a 2011 baseline by 2020.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

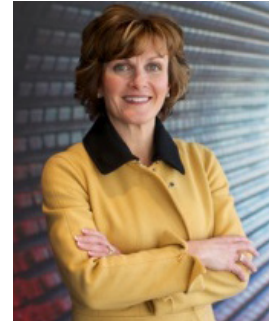
A: It was becoming increasingly apparent that the global economy would demand massive increases in resource productivity. And as one of the largest providers of energy and water-related solutions in the world, we were uniquely positioned to do that at a scale to support efficiency improvements—in EcomaginationSM we launched a big new growth initiative that has not only benefited our own operations and footprint, but has had significant positive impact for our customers and the communities they operate in as well.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: We have several great stories to share. GE's commitment to invest US\$15B in R&D for cleaner technologies has made a significant impact and is helping our customers be more productive. For example, in just ten years, we have seen a total transformation in our lighting business—from compact fluorescent lamps (CFLs) and high-efficiency halogen lamps to the emergence of a whole new asset class of LEDs that has completely disrupted more traditional technologies, and we have achieved this while keeping these new products cost competitive for our customers. And now, in combination with our “Industrial Internet” software solution, we can deliver significant productivity savings. For example, in a pilot program in California for intelligent roadway lighting, our solution is reducing energy consumption and delivering between 50-70 percent energy cost savings.

Q: What has been the biggest challenge to your sustainable products strategy?

A: We learned early on that you can't do this alone. It is critical to collaborate with customers and partners. When we are developing new technologies, it is imperative to be aligned with our customers and understand local market needs. It allows us to bring



Deb Frodl
Global Executive Director
EcomaginationSM, GE

the right solution to the right market at the right time. Our Tier 4 Locomotive is a great example. Our customers were facing new regulations, so we worked with them to be the first to market with new technology solutions that met the standards without requiring an after treatment system. Also, as the world becomes more connected, we need to be focused on business ecosystems that benefit from partnerships. We believe that companies that partner well will drive the future of innovation, whether through new technology or business models.

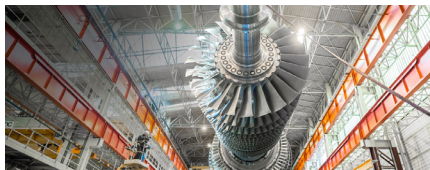
Q: What advice would you give to another company going down this path?

A: What has worked so well at GE is that EcomaginationSM has always been part of the core business strategy of innovation. EcomaginationSM is both a strategy and a commitment. By having a public commitment, it rallies the organization and key stakeholders to deliver results. And much of our success is attributed to our biggest champion, Chairman & CEO, Jeff Immelt.

Product Examples



The **Last Mile Fueling** solution is a fully-integrated technology and logistics system that transforms flare gas into usable natural gas fueling for oil and gas exploration and production operations. Bringing together GE's natural gas fueling technologies and expertise with maintenance and logistics services from Ferus Natural Gas Fuels, the GE and Ferus partnership, called Ferus Natural Gas Fuels (CNG), works hand-in-hand with exploration and production (E&P) customers to provide this full-service solution which provides cleaner, cheaper fueling.



The **HA gas turbine** is the largest, most efficient gas turbine in the industry. Operating at more than 61 percent efficiency, it can power 400,000 US homes and deliver up to US\$10 million in fuel savings each year for customers, compared with F-class technology.



The **Brilliant Wind** Turbine harnesses the power of what GE calls the "Industrial Internet" to analyze tens of thousands of data points every second to manage wind variability and provides reliable, short-term predictable power, while communicating seamlessly with neighboring turbines, service technicians, and operators. The intelligent system enables power producers and the wind turbines themselves to make data-informed decisions. It's also designed to achieve greater efficiency at low-wind-speed sites, enabling more regions to take advantage of local wind power.



GE's **fuel cell-combined cycle** (FC-CC) combines a solid oxide fuel cell (SOFC) and a Jenbacher gas-fueled reciprocating engine that delivers clean, efficient energy that can be dispatched in a distributed power package in applications from 1 to 10 megawatts. The resulting electrical efficiency of the combined process is projected to be 60 to 65 percent. If configured for a combined heat and power (CHP) application, efficiency could be as high as 90 percent.



GE is collaborating with partners (Snecma, Airbus, Boeing, COMAC, and Nexcelle) to develop **CFM LEAP™ * aircraft engines** for the Airbus A320neo, Boeing 737 Max, and COMAC C919 families of aircraft due to enter service in 2016 and 2017. By utilizing an extensive suite of advanced engine technologies, the CFM LEAP™ engines are being designed to provide significant reductions in fuel burn, noise, and NOx emissions compared to the current CFM engine models offered in this aircraft class, at equivalent levels of maintenance cost and reliability.



GE Transportation's **Evolution Series Tier 4 Locomotive** meets the EPA's stringent Tier 4 emission standards and will decrease emissions by more than 70 percent from Tier 3 technology. The locomotive can help save railroad customers more than US\$1.5 billion in infrastructure and operational costs.



Lightgrid is a breakthrough technology system from GE for outdoor wireless control that allows remote monitoring and control, utility-grade energy metering, and GPS mapping of streetlights. In its first city partnership, the deployment of LEDs and LightGrid is expected to save 60 percent on energy costs and reduce CO₂ by 30 percent.

* LEAP is a trademark of CFM, a 50-50 joint venture between Snecma and GE.

COMPANY PROFILE


IBM

COMPANY BACKGROUND

IBM's business model is built to support two principal goals: helping enterprise clients to become more innovative, efficient, and competitive through the application of business insight and IT solutions; and providing long-term value to shareholders. The company's global capabilities include services, software, systems, fundamental research, and related financing. The broad mix of businesses and capabilities are combined to provide integrated solutions to the company's clients. IBM is headquartered in the United States.

IBM'S SMARTER PLANET INITIATIVE

IBM launched Smarter Planet in 2008 as an initiative to implement solutions involving advanced cloud, analytics, mobile, social, and security solutions to help its clients become more innovative, efficient, and competitive. Smarter Planet represents significant business growth opportunities for IBM. While Smarter Planet is not exclusively a portfolio of sustainable products and services, much of what IBM does pursuant to Smarter Planet inherently involves environmental sustainability solutions, such as those related to energy, water, agriculture, transportation, and supply chain.

	
SECTOR/INDUSTRY Information Technology/IT Services	REVENUE (2014) US\$93B
HEADQUARTERS Armonk, NY, USA	WEBSITE www.ibm.com
NUMBER OF EMPLOYEES (2014) 379,592	

Going forward, the opportunities for Smarter Planet solutions will only increase as clients leverage IBM's leading edge cloud, analytics, mobile, social, and security solutions, as well as cognitive computing (i.e., Watson) and other groundbreaking technologies in new Smarter Planet solutions. Opportunities exist to transform entire industries such as healthcare, agriculture, and transportation to make them more efficient, "smarter," and more sustainable.

"IBM considers and integrates environmental sustainability in the development of its products and solutions for clients. Most of our clients' challenges are not solely environmental challenges, but these considerations typically play a key part in business solutions that will be more sustainable. This understanding motivates the company to take an integrated approach to develop solutions that are responsive to clients' business needs while also advancing sustainability."

Wayne S. Balta, Vice President, Corporate Environmental Affairs and Product Safety, IBM

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: IBM's product stewardship program was established in 1991 as a proactive and strategic approach to the environmental design and management of our products. At that time, IBM already had a long history of controlling and managing the environmental aspects of its manufacturing operations to minimize environmental impacts, but we also realized that environmental impacts from use and disposal of our products were equal or greater than those posed by IBM's internal manufacturing operations. As a result, we established our product stewardship program and embarked on a nearly quarter of a century strategic effort to develop, manufacture, and market products that are increasingly energy efficient. This includes products that can be upgraded and reused to extend product life, that incorporate recycled content and environmentally preferable materials and finishes, and that can be recycled and disposed of safely.

IBM's business has continued to transform over the last 20 years, evolving from a vertically integrated manufacturer of hardware and software products to a company that provides a full array of IT services and solutions for our clients. While we continue with our focus on reducing our operational impact on the environment and delivering more energy efficient and sustainable hardware products, we understand that the greatest opportunity we have as a company to contribute to the sustainability of our planet is through innovation and the application of our technologies and solutions to solve the sustainability challenges of our clients.



Edan Dionne
Director
Corporate Environmental Affairs
IBM

IBM takes an approach that integrates environmental sustainability throughout our products and services. IBM's Smarter Planet strategy resulted from listening to clients, understanding their problems, and figuring out how to apply IBM's technologies and solutions to make their businesses more efficient (smarter). Much of what we do pursuant to a Smarter Planet inherently involves environmental sustainability, but our Smarter Planet strategy was not conceived with a singular focus on environmental sustainability. Our Smarter Planet initiative aims to make what we do—whether it is a business, a process, or a practice, whether it involves a private enterprise, government, or society at large—more efficient, and as a result, also more sustainable.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: As stated above, we do not consider our Smarter Planet strategy a mere "sustainable product." With that said, the scale of various projects that we have tackled pursuant to this initiative is huge, and the benefits to our clients and society are and continue to be tremendous. We believe the key to its success was the initiative's focus on solving problems without limiting the scope and nature of these challenges. We also believe the best of A Smarter Planet is yet to come. The application of ever advancing analytics and mobile technologies will result in continued and significant improvements to how businesses, governments, and infrastructure operate, and through taking an integrated approach, result in sustainability improvements.

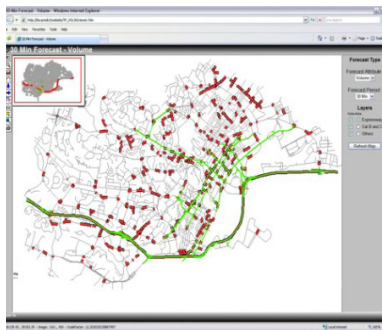
Q: What has been the biggest challenge to your sustainable products strategy?

A: Once again, we are motivated to develop products and solutions to help our clients solve their problems. And most of those problems in and of themselves were not “sustainability” problems. Businesses and governments are looking to become more efficient, offer better and more convenient services to their customers and constituents, and reduce their costs. Do they care about “sustainability?” Certainly! But it usually isn’t the factor that drives decision making. We understand that and take an integrated approach to develop our offerings that are responsive to clients’ needs while advancing sustainability.

Q: What advice would you give to another company going down this path?

A: We believe the key to developing sustainable products and solutions is to understand and communicate the business advantages these products and solutions provide to clients. It’s great to be able to point to reductions in energy consumption, greenhouse gas emissions, or water withdrawals associated with implementing a new product or solution, but for these practices to be sustained, they need to also be understood in the context of the client’s business—how and why these products and solutions can not only improve sustainability but also their bottom line or top line growth. The great thing is that in IBM’s experience, the two outcomes can, and usually do, go hand in hand. When a business takes a long-term view, making it more sustainable almost always improves the bottom line and top line growth.

Product Examples



The **IBM® Traffic Prediction Tool** tackles traffic congestion by using historical and real-time traffic data to predict traffic flows for intervals of up to 60 minutes. The tool integrates information about the flows of different forms of transportation, from cars to trains and buses, to determine flow at specific locations in the near future. This avoids emissions due to congestion and inefficient route planning and reduces the need for massive infrastructural overhauls to accommodate growing traffic.

IBM® Intelligent Water optimizes water operations to create new opportunities for innovation and business value by delivering integrated insights into a utility's infrastructure, assets, and operations. The Intelligent Water solution helps water and wastewater operators:

- Leverage operational data holistically to create insights and improve water management;
- Anticipate potential delivery disruption and better forecast long-term water demand; and
- Coordinate resources to protect water supply and drive conservation and sustainability.

The **IBM Wind Power Suite** utilizes proprietary and IBM business partner solutions to turn a conventional wind farm into a smart farm that runs more efficiently and profitably. This solution can help:

- Lower costs through increased predictive maintenance;
- Minimize downtime and unplanned repairs;
- Improve visibility and control of wind operations by applying industry standards to aggregate data from multiple turbines into a single view; and
- Increase revenue through improved turbine availability and wind farm production.

IBM estimates that when all the labor and cost benefits are added up, wind farms deploying an effective asset management solution stand to realize a 20 percent cost reduction in operations and maintenance.

IBM's **Precision Agriculture** solutions can help agribusinesses better analyze water usage, crop yields, farm labor costs, growing patterns, and sales and distribution processes to gain insights to improve profitability. Gallo Winery, for example, has used IBM's solution to calculate optimum water and fertilization needs by plant, rather than vineyard, based on soil mapping, high-resolution satellite data, and farm-level observations. Automated irrigation systems are then able to deliver water and fertilizer precisely when and where needed. IBM's solution helped the winery reduce water consumption in a test vineyard by 20 percent, with an expected 10 to 20 percent increase in crop yield.

COMPANY PROFILE

Johnson & Johnson

COMPANY BACKGROUND

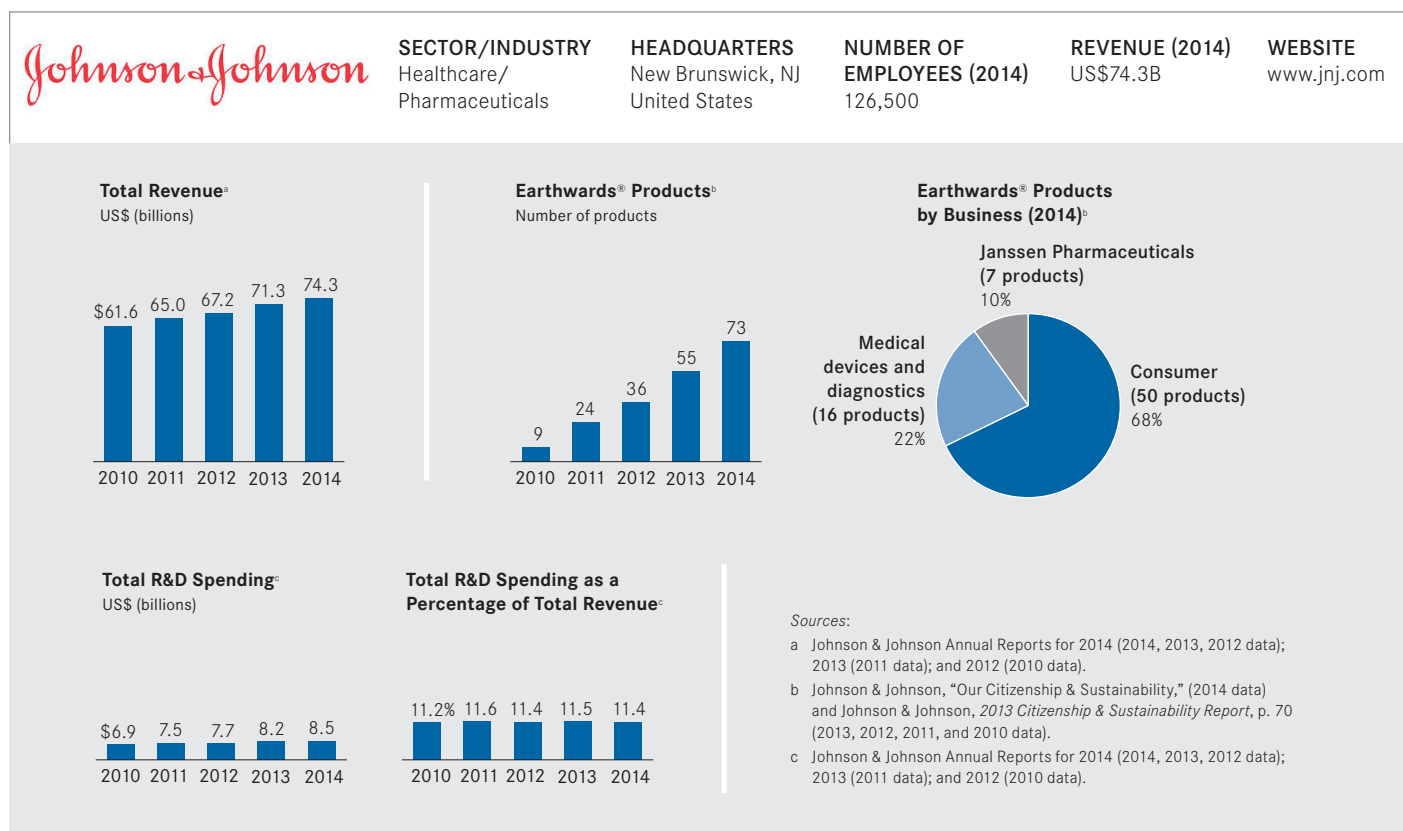
Johnson & Johnson is a global manufacturer of health care products. The company is based in the United States and provides products and services for the consumer, pharmaceutical, and medical devices and diagnostics markets.

EARTHWARDS® PRODUCTS

Johnson & Johnson's Earthwards® product portfolio houses the company's most broadly sustainable products. Earthwards® reflects the company's commitment to product stewardship and innovation by encouraging the

design of more sustainable solutions across a product's lifecycle. To achieve Earthwards® recognition, products must achieve three significant improvements across seven sustainability action areas: sustainability in materials, packaging, energy, waste, water, social impact, or innovation.

The number of Earthwards® recognized products has increased from nine in 2010 to 73 products in 2014. Total sales from Earthwards® recognized products in 2014 exceeded US\$8 billion, or about 11 percent of the company's revenue for the year. A key driver of success has been generating excitement and adoption of sustainable



“Earthwards® is an incredibly valuable tool as it helps us encourage and quantify product improvements based on lifecycle thinking.”

Michael Moscherosch, Director External Growth & Materials Innovation, Johnson & Johnson

product development through employee recognition. Johnson & Johnson places a strong focus on engaging employees at various levels, soliciting their ideas, and rewarding them for their contributions. Teams who receive Earthwards® recognition are publicly congratulated and rewarded for their innovations by Johnson & Johnson leadership through established employee recognition programs. As a result, the company increased internal awareness of the Earthwards® process from seven percent in 2012 to 24 percent in 2014, and increased the percentage of employees that agree that Earthwards® offers value to Johnson & Johnson’s customers from 45 percent to 74 percent.

R&D

Johnson & Johnson’s total R&D spending increased from US\$6.9 billion in 2010 to US\$8.5 billion in 2014, an increase of about 19 percent. As a share of total revenue, the company’s R&D spending has remained consistent at about 11 percent of total revenue.

GOVERNANCE

The concept for Johnson & Johnson’s Earthwards® initiative was first introduced in 2009 as the company’s proprietary product life cycle analysis process. To ensure continued relevance, Johnson & Johnson regularly engages outside experts on best practices and seeks third party counsel to review and provide feedback on Earthwards®. The company has engaged experts such as Andrew Winston, author of *Green to Gold*, and Hunter Lovins, co-author of *Natural Capitalism*, to examine products and score-card criteria to continually evaluate and enhance the Earthwards® process. The Earthwards® process undergoes external review and assurance on an annual basis by UL Environment, which assures adherence to the program’s criteria and drives recommendations that help improve future sustainable product development.

Earthwards® was incorporated into Johnson & Johnson’s *Healthy Future 2015* sustainability and citizenship initiative, a set of five-year goals introduced in 2011. One of the goals set by the initiative included reaching 60 Earthwards® products by 2015. Over the past five years, more than 200 employees have directly participated in Earthwards®, helping Johnson & Johnson deliver on its Healthy Future 2015 commitments and address customers’ growing demand for more sustainable products. In 2014, the company expanded its Earthwards® portfolio to include 73 recognized products, surpassing the 2015 goal one year ahead of schedule.

The Earthwards® approach applies to all new products and packaging at Johnson & Johnson. In the broadest application, Earthwards® works to ensure regulatory compliance to relevant product stewardship regulations and deliver on Johnson & Johnson’s high standards. After ensuring compliance, Earthwards® seeks to use life cycle thinking to identify and implement significant sustainability improvements to the company’s products.

The Earthwards® approach is Johnson & Johnson’s way of addressing the impacts of the company’s products throughout their life cycles and a response to customers’ and consumers’ expectations for more responsible products. In product development, Johnson & Johnson seeks opportunities for green chemistry, removal of materials of concern, and more sustainable packaging solutions. And at the end of product life, the company is working to encourage recycling and reprocessing of equipment. Beyond environmental impacts, Johnson & Johnson also looks for products and sourcing to benefit the communities where they operate. One example of this is Johnson & Johnson’s membership in the billion dollar roundtable, which recognizes companies that partner with diverse and woman-owned suppliers.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: There has been a growing desire of our customers to have products with improved environmental profiles and we must listen to customers to understand their sustainability needs. At Johnson & Johnson, Our Credo challenges us to put the needs and well-being of the people we serve first. That's why we focus our Earthwards® process to make the improvements that are desired or required by our buyer or end-user. Responding to their needs creates loyalty and a favorable perception of our products, while solving a problem for the buyer and the end-user, and could lead to new ideas in sustainable product development.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: One of the biggest success stories is the collaboration we have with the Neutrogena® Naturals™ Brand. This is the first of our brands in which every product has been designed with significant sustainability improvements from the beginning, resulting in all products receiving Earthwards® recognition.



Al Iannuzzi
Senior Director
EHS&S, Johnson & Johnson

Q: What advice would you give to another company going down this path?

A: One of the most important aspects to consider is to create a simple, effective framework for greener product development. We provide a single approach across a diverse set of businesses that guides development teams to improve existing products. The Earthwards® approach encourages employees to broaden their perspective, designing improvements across the product's life-cycle—from procurement and manufacturing to use and end-of-life. Teams work together on the most important areas of impact to design more sustainable solutions that add commercial value to stakeholders along the entire value chain from suppliers to recyclers.

Product Examples



Neutrogena® Naturals™ Purifying Makeup Removing Cleansing Towelettes Over 90 percent of the product's ingredients are naturally derived, including the plastic. Instead of using polyester petroleum based plastic, this product uses polylactide biodegradable and renewable plastic.



ENSEAL® G2 Articulating Tissue Sealers Innovations in product and packaging weight have contributed to a worldwide annual reduction of approximately 3 tons* (6,655 lbs.) of red bag waste or the equivalent of the daily waste of 1,533 people in the US and a worldwide annual reduction of 5 tons† (11,473 lbs.) of packaging waste and approximately 5 tons (11,146 lbs.) of PVC, a recognized material of concern.



Zytiga® Compared to previous generations, the latest generation process for developing this prescription drug uses 64 percent fewer raw materials by improving overall yield through green chemistry. This also translates into 78 percent less water use and 87 percent less hazardous waste created through the compound synthesizing process.

* Product weight reduction from .67 lbs. (NSLG2S35) to .58 lbs. (NSLG2S35A) with anticipated sales of over 74,000 per year.

† Packaging weight reduction from .47 lbs. (NSLG2S35) to .32 lbs. (NSLG2S35A) with anticipated sales of over 74,000 per year.

COMPANY PROFILE

Kimberly-Clark

COMPANY BACKGROUND

Kimberly-Clark's three primary business segments include Personal Care, Consumer Tissue, and K-C Professional. The Personal Care and Consumer Tissue segments manufacture and market products for household use, including brands such as Kleenex®, Scott®, Huggies®, Pull-Ups®, Kotex®, and Depend®. The K-C Professional segment manufactures and markets related products for the company's business-to-business (B2B) marketplace.

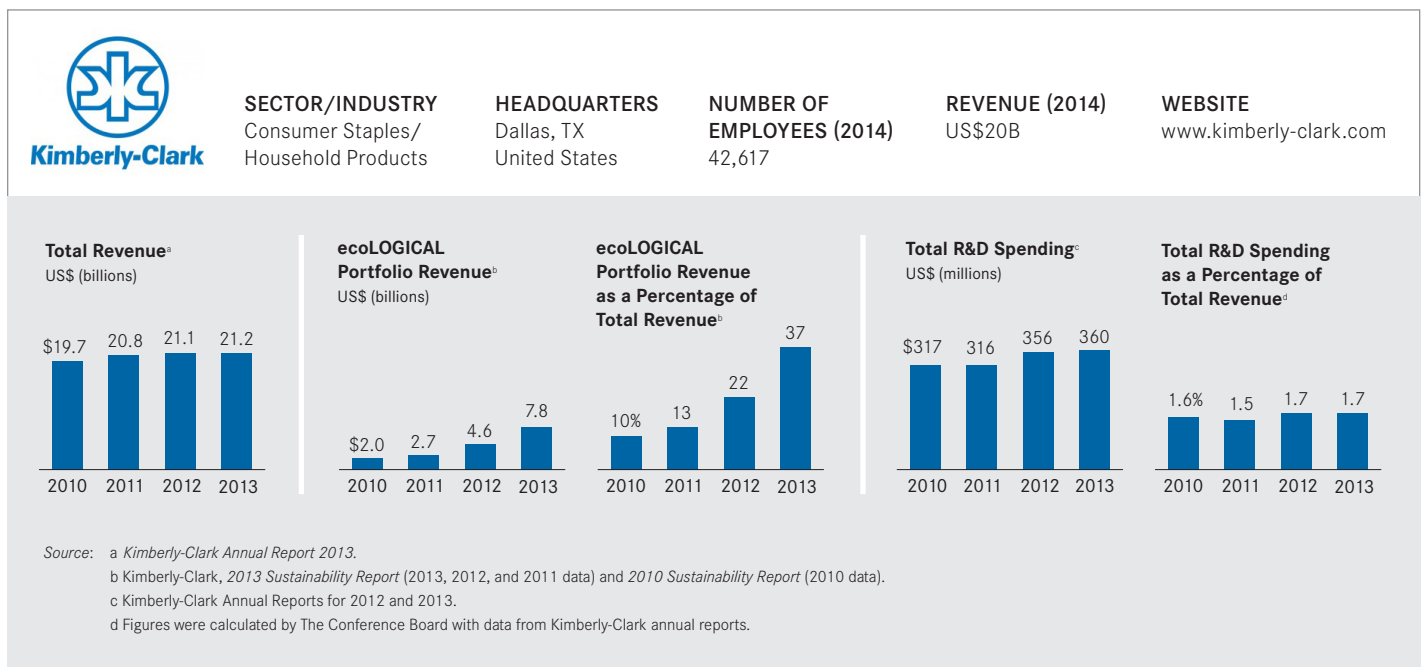
REVENUE FROM KIMBERLY-CLARK'S ECOLOGICAL PORTFOLIO

In 2011, Kimberly-Clark set a goal to achieve 25 percent of net sales from environmentally innovative products by 2015, a target which was surpassed in 2013. To help achieve this goal, the company introduced its ecoLOGICAL model to establish a global portfolio of environmentally

innovative products and develop a tool to measure progress toward this goal. The model includes an environmental innovation scorecard and rating system, plus tracking of sales against those stock keeping units (SKUs) that meet the performance criteria.

Before being included in the ecoLOGICAL portfolio, products must be evaluated and qualified in at least one of four categories:

- Responsible materials—including rapidly renewable materials, third-party-certified materials, and post-consumer materials
- Life cycle footprint
- Third-party certification
- Breakthrough environmental innovation



“Our mission to deliver essentials for a better life is at the foundation of our vision for sustainability. Providing products that can help to deliver social benefits to those in need or improve environmental performance enables that vision in a way that we hope engages customers and consumers in the conversation.”

Lisa Morden, Senior Director, Global Sustainability, Kimberly-Clark

Revenue from Kimberly-Clark’s ecoLOGICAL portfolio increased from US\$2 billion in annual revenue in 2010 to US\$7.8 billion in 2013, a 290 percent increase. By comparison, 2013 total company revenue showed an increase of only 7.6 percent over 2010 total revenue. Revenue from ecoLOGICAL products accounted for 37 percent of total company revenue in 2013, up from only 10 percent in 2010. Key drivers of success have included expansion of the portfolio of environmentally innovative products (e.g. Scott® Naturals Tube Free Bathroom Tissue), certification of existing products (e.g. Forest Stewardship Council Chain of Custody Certification) and materials reduction.

INNOVATION FOR SUSTAINABILITY

Kimberly-Clark’s total annual R&D spending in 2013 amounted to US\$360 million, a 14 percent increase over levels in 2010. Innovation is an integrated process at Kimberly-Clark with several value drivers including addressing customer/consumer needs, improving materials/supply chain/manufacturing efficiencies and costs, and furthering the long-term mission of the company to “deliver essentials for a better life.” Sustainability-related innovation at Kimberly-Clark is currently focused in the following areas:

- Alternative materials to limit dependence on wood fiber in order to reduce forest destruction; and
- Reducing material weight to reduce solid waste.

GOVERNANCE

Kimberly-Clark’s ecoLOGICAL model was established in 2010 as a tool to enable the company’s progress toward its *Sustainability 2015* goals. The company’s sustainability targets are built around the pillars of “People, Planet, and Products.” Each pillar has clear and measurable goals, including the goal set to achieve 25 percent of sales from environmentally innovative products.

The ecoLOGICAL program is managed formally by Kimberly-Clark’s Global Sustainability team, in partnership with the company’s regional business teams around the world. On an annual basis, products achieving the requirements and their associated net sales are compiled. The process is subject to the assessment that is conducted by a third party that assures Kimberly-Clark’s sustainability reporting.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: Historically, sustainability had a very operations-oriented focus in Kimberly-Clark. Our sustainability journey started with establishing environmental targets designed to reduce our manufacturing impacts. In order to expand the sustainability conversation within the company and to engage both our marketing and innovation teams (ergo customers/consumers), we added a specific “Products” pillar to our strategy.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: We are very excited about Scott® Naturals Tube Free Bath Tissue product which was launched nationally in the US last year.

- Tube Free is easy for consumers to grasp and understand and gives them an easy reason to switch from their non-Forest Stewardship Council (FSC)-certified brand of bath tissue to an FSC-certified brand.
- The Tube Free commercial program started a conversation about sustainability in a category with limited innovation and where the green options often have low quality and high price.
- Tube Free lends itself well to social media. We had 6.3 Million people pledge to “toss the tube” with 113 million impressions over a 10 week period. We even got unsolicited tweets from Bob Vila and Arsenio Hall.



Lisa Morden
Sr. Director, Global Sustainability
Kimberly-Clark

Q: What has been the biggest challenge to your sustainable products strategy?

A: One of our most significant challenges remains in building the mindsets and capabilities for sustainability innovation within our teams. We have many brilliant and passionate people interested in delivering environmentally advantaged products, but the definitional complexity is a barrier.

Q: What advice would you give to another company going down this path?

A: It is essential to put your teams and people at the front of the strategy. In other words, unleashing the creativity and intellectual capacity of innovation teams requires deep engagement and understanding of the overall sustainability vision of the company, in addition to enablement with tools, training, and other resources.

Product Examples



VIVA® Paper Towel with Bamboo Fiber In Kimberly-Clark's Australia business, the Viva® brand launched a bamboo fiber paper towel in 2013 as a more forest-friendly alternative to regular paper towels that depend on wood fiber. Bamboos grow up to five times faster than trees and bamboo fiber equals wood fiber in strength and absorbency, making it an ideal renewable substitute. The bamboo is not the type consumed by pandas and is guaranteed sourced from forests that are not inhabited by pandas.



Scott® Naturals Tube Free With the exception of Scott®, “green” bath tissue’s sliver of the market category has been flat as consumers are increasingly dissatisfied with the softness and quality of eco-friendly toilet papers. Scott® Naturals Tube Free, launched nationally in the US in 2014, aimed to change the conversation with consumers.

COMPANY PROFILE

Royal Philips

COMPANY BACKGROUND

Royal Philips is a diversified health and well-being company, focused on improving people's lives through meaningful innovation in the areas of Healthcare, Consumer Lifestyle, and Lighting. Headquartered in the Netherlands, the company is a leader in areas such as cardiac care, acute care and home healthcare, energy efficient lighting solutions and new lighting applications as well as oral healthcare.

REVENUE FROM GREEN PRODUCTS

As part of the company's EcoVision initiative, Philips tracks sales from its portfolio of Green Products. This portfolio is defined by products which offer a significant environmental improvement in one or more green focal areas: energy efficiency, packaging, hazardous substances, weight, recycling and disposal, and lifetime reliability. Sales from Green Products reached US\$14.1 billion in 2014, a 60 percent increase over



SECTOR/INDUSTRY
Industrials/Industrial
Conglomerates

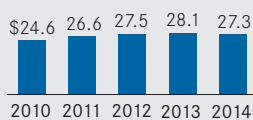
HEADQUARTERS
Amsterdam, Netherlands

**NUMBER OF
EMPLOYEES (2014)**
113,678

SALES (2014)
US\$27B

WEBSITE
www.philips.com

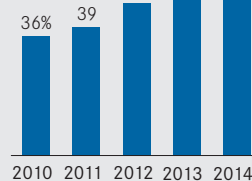
Total Revenue^a
US\$ (billions)



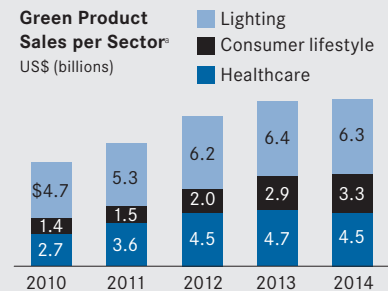
Green Products Revenue^a
US\$ (billions)



Green Products Revenue as a Percentage of Total Revenue^a



Green Product Sales per Sector^a
US\$ (billions)



Total R&D Spending^a
US\$ (billions)



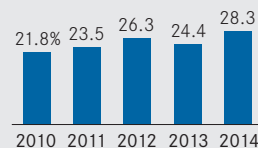
Total R&D Spending as a Percentage of Total Revenue^a



Green Innovation R&D Spending^a
US\$ (billions)



Green Innovation R&D Spending as a Percentage of Total R&D Spending^a



Note: Figures in USD were converted from EUR.

Source: ^a Philips Annual Report 2014.

^b Figures were calculated by The Conference Board with data from Philips annual reports.

“We see that social and environmental considerations have become a crucial element in customers’ decisions and we believe that embedding sustainability into our businesses will offer us substantial new opportunities to accelerate our innovation and growth.”

Jim Andrew, Chairman of the Sustainability Board and Chief Strategy & Innovation Officer, Philips

2010 sales.* In comparison, total company sales in 2014 only increased 11 percent over 2010 sales. Philips’ Green Products accounted for 52 percent of the company’s total sales in 2014.

Of the US\$14.1 billion Green Products sales in 2014, Philips’ Lighting business contributed the largest share at 45 percent. This was followed by its Healthcare and Consumer Lifestyle businesses, each contributing 32 percent and 23 percent, respectively. Since 2010, Philips’ Healthcare and Consumer Lifestyle businesses have increased their contribution to Green Products revenue through a greater focus on the circular economy concept (a circular economy aims to decouple economic growth from the use of natural resources and ecosystems by using those resources more effectively†). Key drivers of success have been, amongst others, applying recycled plastics in Philips’ consumer products (for example vacuum cleaners and coffee machines) and creating a market for refurbished Healthcare equipment.

* Currency equivalents were calculated using the yearly average currency exchange rates of the US Internal Revenue Service, <http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates>.

† For an overview of Philips and the circular economy concept, see “Circular economy,” Philips, <http://www.philips.com/about/sustainability/ourenvironmentalapproach/greeninnovation/circulareconomy.page>

R&D SPENDING ON GREEN INNOVATION

Philips spent US\$2 billion in total R&D in 2014, or 7.6 percent of total sales. The 2014 figure is a 14 percent increase over the company’s total R&D spending in 2010. R&D expenditure on Green Innovation focuses on developing products in Philips’ Green Products portfolio. These products tackle water, air, and waste challenges, as well as materials and energy efficiency. More than US\$590 million in R&D was allocated to these products in 2014. Green Innovation R&D accounted for 28 percent of total R&D in 2014, up from 22 percent in 2010. Over 55 percent of Green Innovation expenditure is allocated to the Lighting business. Future Green Innovation investments will be targeted toward advancing research in:

- Energy efficiency, such as phasing out traditional lighting with LED lighting;
- Recycling materials, to close the materials loop in the lighting and consumer lifestyle segment;
- Healthcare system refurbishment, to extend the life cycle of healthcare equipment; and
- Circular business models, such as performance-based models where benefits or services are sold instead of a product.

“In 2014, our Green Product sales exceeded half of total sales, showing that our sustainable performance has resulted in a stronger demand driver for our brand. We believe that adopting a circular economy approach to our business models, materials reuse and design, will further give us a competitive advantage while making the world more sustainable.”

Henk de Bruin, Head of Group Sustainability, Philips.

GOVERNANCE

EcoVision is Philips' strategy for meeting the company's sustainability goals. Now in its fifth generation, Philips launched the first EcoVision initiative, primarily focused on operations and products, in 1998. Significant savings were realized in energy reduction, water recycling and usage reduction, and material reuse and reduction. In 2003, EcoVision was extended to cover supply chain sustainability, and in 2010, the initiative extended to include the social dimension of products and solutions. The current strategy includes key performance indicators in the following areas: Green Product sales, people's lives improved, Green Innovation, green operations, health &

safety, employee engagement, and supplier sustainability. The company's broad goal is to improve the lives of three billion people a year by 2025.

The Green Product portfolio within the EcoVision program is Philips' sustainable products and innovation initiative. Philips aims to transition its industry towards a circular economy, with a focus on decoupling economic growth from the use of natural resources by innovating in the areas of materials, components, and product reuse. Philips is also shifting its business model towards providing business to business (B2B) and business to government (B2G) services and solutions to minimize the company's impact on ecosystems.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: Already in the early eighties Philips focused on energy efficient and sustainable factories which was later formalized in the EcoVision program in the nineties. Through our green focal areas, the focus moved to products and services. Today the implementation of new, sustainable business models, cost reduction, and meeting the needs of today's customers are all starting points to develop Green Products.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: Philips refurbished medical systems have been very successful in developing a market for pre-owned medical equipment. Also, the parts harvesting business in which used parts are refurbished and used again, helps to deliver high quality parts at lower costs than new parts. The refurbishment business has effectively demonstrated the financial and environmental benefits of circular economy in the healthcare industry.

Q: What has been the biggest challenge to your sustainable products strategy?

A: Although we like to increase the use of recycled plastics in our consumer products, very often we cannot find the right quality level from our suppliers. For example,

an attractive, glossy, colorful outer shell is hard to manufacture with recycled plastics. However, we have found ways to effectively use recycled plastics inside the products as is the case in the latest coffee maker Senseo Up, with a total of 13 percent recycled plastics.

Q: What advice would you give to another company going down this path?

A: Review the portfolio and research opportunities to reuse, reduce, and recycle. Do not focus on products only but also look at suppliers and new business models. For example, design for easy upgrades, easy maintenance, or easy repair will support new services. Design for easy refurbishment will retain the value of the product at the end of its first lifecycle. Design for disassembly will increase the residual value at end of life.



Markus Laubscher
Program Manager, Circular Economy
Philips Group Sustainability

Product Examples



Philips Lighting Service Solutions As part of the company's move towards the circular economy, Philips now provides light-as-a-service solutions as an alternative to the traditional business of selling lighting fixtures. The light-as-a-service model provides incentive for Philips to provide the most energy-efficient service possible since customers rent the lighting equipment and pay a flat rate for a set level of lighting performance. If customers use more energy than anticipated for their operations, customers receive cash back from Philips. Lighting-as-a-service also provides the benefits of keeping fixtures regularly updated as the service gets renewed, preventing wasteful lighting overhauls.



SlimStyle LED Replacement Lamp Philips' circular economy initiative places greater focus on designing products for high-quality reuse. The SlimStyle LED replacement lamp (2014) is one such product designed with this new focus in mind. Key design innovations include: a relatively flat geometry for better heat elimination (to eliminate the need for aluminum heat sinks, which hamper recycling efforts), elimination of different materials by making the housing case and lamp lens one and the same component, a composition that falls apart into easily reusable fractions when crushed during recycling, and substituting ultrasonic welding for glue to reduce polluting materials used during production.



The SENSEO Up coffee maker, a product from Philips' Consumer Lifestyle business, contains 13 percent recycled plastics. Most of the recycled plastics are in the baseplate, which is composed of 90 percent plastic from post-consumer electronic waste. This product is part of Philips's initiative to use over 3,500 tons of recycled plastics by 2015.


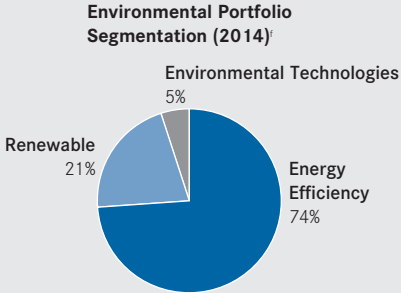
COMPANY PROFILE

Siemens AG

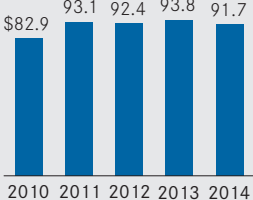
COMPANY BACKGROUND

Siemens is a German industrial conglomerate and one of the world’s largest technology companies. The company is building on its positioning along the electrification value chain, which constitutes the company’s core business. Siemens businesses are segmented into the following nine divisions: power and gas, wind power and renewables,

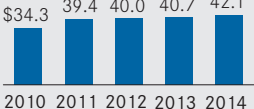
energy management, building technologies, mobility, digital factory, process industries and drives, healthcare, and financial services. Core products include medical diagnostics equipment, industrial manufacturing automation, gas and steam turbines, wind turbines, and rail equipment and systems such as rail electrification.

	SECTOR/INDUSTRY Industrials/Industrial Conglomerates	HEADQUARTERS Munich, Germany	NUMBER OF EMPLOYEES (2014) 343,000	REVENUE (2014) US\$92B	WEBSITE www.siemens.com
					

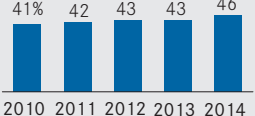
Total Revenue^a
US\$ (billions)



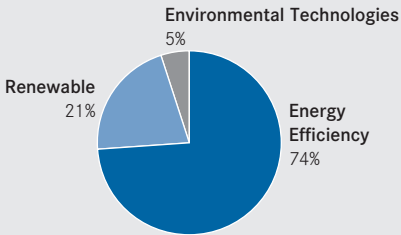
Environmental Portfolio Revenue^a
US\$ (billions)




Environmental Portfolio Revenue as a Percentage of Total Revenue^b




Environmental Portfolio Segmentation (2014)^c



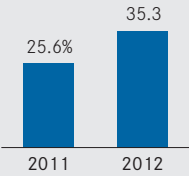
Total R&D Spending^d
US\$ (billions)



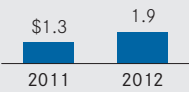
Total R&D Spending as a Percentage of Total Revenue^e



Environmental Portfolio R&D Spending as a Percentage of Total R&D Spending^f



Environmental Portfolio R&D Spending^g
US\$ (billions)



Note: Figures in USD were converted from EUR.

Source: a Siemens Annual Report 2014.
 b Siemens Annual Report 2014 (2014 and 2013 data for “environmental portfolio”) and Siemens email communication to The Conference Board, May 6, 2015 (2012–2010 data).
 c Siemens Annual Report 2014 (2014 and 2013 figures), Siemens Annual Report 2013 (2012 and 2011 figures); Siemens Annual Report 2012 (2010 figures).
 d Siemens press release, <http://www.siemens.com/press/pool/de/events/2012/corporate/2012-03-patent/factsheet-fe-en.pdf>.
 e Figures calculated by The Conference Board with data from Siemens press release, <http://www.siemens.com/press/pool/de/events/2012/corporate/2012-03-patent/factsheet-fe-en.pdf>.
 f Siemens email communication to The Conference Board, March 27, 2015.

“When it comes to energy efficiency, environmental and economic benefits go successfully hand in hand. Innovative technologies of our Environmental Portfolio enable our customers to cut energy costs and reduce their CO₂ emissions. The increasing revenue share over time clearly shows the growth potential of energy and resource efficient technologies. Furthermore, the Environmental Portfolio demonstrates our contribution to societal challenges such as climate change mitigation.”

Ralf Pfitzner, Corporate Development Strategy – Sustainability, VP Strategy & Environmental Portfolio, Siemens

SIEMENS ENVIRONMENTAL PORTFOLIO

Siemens tracks revenue from an “Environmental Portfolio” (EP) which consists of products, solutions, and services that contribute to environmental and climate protection. Inclusion in this portfolio is primarily based on three criteria:

- Energy efficiency, specifically products that offer at least a 20 percent energy efficiency increase over comparable solutions or a reduction of at least 100,000 metric tons of carbon dioxide per year in the customer use phase;
- Renewable energy sources, such as wind turbines, and smart grid applications and components, such as smart meters; and
- Environmental technologies, such as pollution control or water treatment systems.

The largest contribution to Siemens’s EP revenue comes from energy efficiency products, which accounted for nearly three-fourths of total EP revenue of US\$42 billion* in 2014. Overall, Siemens’s EP revenue accounted for 46 percent of the company’s total revenue in 2014, and increased by 23 percent compared to revenue reported for fiscal 2010. From 2010 to 2014, total company revenue increased by about 11 percent. Key drivers of EP growth have been the company’s wind power business, efficient fossil power plants, and gas turbines, as well as energy efficient building technologies.

* Currency equivalents were calculated using the yearly average currency exchange rates of the US Internal Revenue Service, (<http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates>).

R&D SPENDING ALLOCATED TO THE ENVIRONMENTAL PORTFOLIO

Siemens’s total R&D spending in 2014 amounted to US\$5.2 billion or about six percent of total revenue, an increase of 15 percent since 2010. In 2011 and 2012, Siemens mapped the R&D spend allocated to businesses represented in the company’s EP. This R&D spend amounted to approximately US\$1.3 billion in 2011 and US\$1.9 billion in 2012, or about 26 percent and 35 percent of total R&D spend, respectively. Since 2012 Siemens has opted not to track or publish sustainability-related R&D for two reasons: Siemens’s approach is to integrate sustainability aspects in all R&D, and R&D intensity varies significantly by business given the company’s diverse business portfolio.

Of the 56,000 patents owned by Siemens in 2014, about two-fifths (22,200) are related to its EP. Siemens’ R&D policy encourages open collaboration with outside organizations, and R&D investments are targeted toward advancing research in several areas:

- Developing methods for the efficient generation and transmission of electrical energy, including advanced gas turbines that increase the efficiency and reduce emissions of power plants, and innovations for reducing the cost and increasing the efficiency of wind turbines (offshore and onshore)
- Achieving greater energy efficiency, reducing raw material consumption, and lowering emissions within the businesses of industry automation and drive systems

- Developing technology-based service concepts such as energy management and remote maintenance systems
- Sustainable technologies for major metropolitan areas and their infrastructures, such as building technologies that conserve energy, solutions for ensuring an efficient and secure supply of electricity in cities, intelligent traffic and transport systems, and solutions to integrate buildings into smart grids.

GOVERNANCE

Siemens's sustainability strategy (until 2014) focused on three pillars: "Business Opportunities," "Walk the Talk," and "Stakeholder Engagement." "Business Opportunities" led to the creation of the company's EP, and has also pushed innovation in business models. The "Walk the Talk" strategic area focused on Siemens's corporate citizenship contributions and aimed to ensure resource efficiency, in-house emissions reductions, and strong health and safety practices. The focus on "Stakeholder Engagement" promoted collaboration with communities and global institutions to help drive innovation and meaningful impact. Currently, Siemens is revising its sustainability strategy within the company's "Vision 2020" strategy.

The company's EP was developed in 2007 as part of a strategic project addressing growth opportunities in the field of energy and environmental care. The EP was also launched as a way of quantifying the material impact Siemens can have on climate change mitigation through use of the company's energy efficient and low-carbon products, solutions, and services. Siemens developed a KPI to track this impact—"CO₂ abatement of customers"—which is now included in the company's annual reporting. In 2014, for example, Siemens's products helped customers save 428 million metric tons of CO₂ emissions, equivalent to approximately 50 percent of Germany's annual CO₂ emissions.

Initial targets for the company's EP revenue (€25 billion by 2011) and CO₂ abatement (300 million metric tons of CO₂ by 2011) were launched in 2008 and achieved in 2010, one year ahead of schedule. In 2010, Siemens set a new target: to exceed €40 billion in revenue from its EP by the end of fiscal 2014 (the target was not met due to recent portfolio changes; EP revenue totaled €33 billion in 2014).

Siemens's sustainability office runs the company's EP process, and each division has assigned environmental portfolio managers. The annual process for determining inclusion and exclusion of EP technologies is based on a methodology that is externally verified. Revenue and carbon abatement figures associated with the EP are also verified by independent auditors.

Siemens has a sustainability board that acts as a steering committee for Siemens' sustainability program and activities. It is chaired by Chief Sustainability Officer and Managing Board Member Roland Busch and consists of senior leaders from divisions; functions such as human resources, corporate strategy, and communications; and representatives from geographic regions. While Siemens's sustainability office coordinates company-wide sustainability programs, the actual implementation of programs, targets, and initiatives falls to operating units with dedicated employees in specialist functions related to environmental protection and corporate citizenship.

In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: The main motivation was to address strategic growth opportunities in the field of energy and resource efficiency and renewable energy technologies. Furthermore, the Siemens Environmental Portfolio demonstrates how we support our customers in saving energy costs and reducing their carbon footprint. Last but not least, it shows how Siemens responds to the societal challenge of climate change.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: The Environmental Portfolio outperformed other businesses in terms of growth. The key to this success was the customer focus of Siemens' businesses, addressing their demands in terms of energy efficiency and renewable energy technology with innovative products and solutions.

Q: What has been the biggest challenge to your sustainable products strategy?

A: The challenge was to define credible criteria for inclusion of products and solutions into the Environmental Portfolio as there were no global standards on energy efficiency or "green" technologies. We developed our own standard and implemented it. To ensure credibility, we decided to be very transparent in reporting and disclosure.

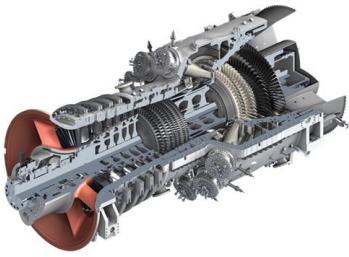


Ralf Pfitzner
VP Strategy & Environmental Portfolio
Corporate Development Strategy—
Sustainability
Siemens

Q: What advice would you give to another company going down this path?

A: First, you have to identify the material topics which matter to your customer and/or society. Second, when setting up any kind of initiative, be aware of tradeoffs between accuracy/transparency and reporting efforts. Being pragmatic while credible is the key to success.

Product Examples



SGT5-8000H Gas Turbine Combined cycle power plants, based on gas and steam turbines, guarantee considerably higher efficiency levels than conventional power plants. They thus lead to reduced CO₂ emissions as well as lower energy costs. In 2012, Siemens received the German Industry's Innovation Award for creating the world's most efficient and most powerful gas turbine, the SGT5-8000H Gas Turbine. This latest generation took a decade of development, more than 750 Siemens employees, and nearly US\$0.6 billion in direct R&D investment. The SGT5-800H has an efficiency of 60.75 percent in combined cycle operation, which makes it the most important component of the most efficient gas-fired power plants in the world. The turbine is designed to generate 400 megawatts (MW) when operating just in gas turbine mode and up to 600 MW when operating in combined cycle mode. The turbine can produce as much power as 1200 Porsche 911 Turbos. A single SGT5-8000H Gas Turbine is enough to supply an entire city the size of Berlin.



SWT-6.0-154 Offshore Gearless Wind Turbine Siemens installed the first offshore wind power plant in 1991, and remains the global market leader in offshore wind power. The SWT-6.0-154 offshore gearless wind turbine has 50 percent fewer moving parts than comparable geared machines and a tower head mass of 360 tons. This low-weight standard significantly reduces infrastructure, installation, and servicing costs. The six megawatt wind turbine is designed specifically for harsh offshore environments.



Velaro D Siemens's latest Intercity-Express 3 (ICE 3) high-speed train model, the Velaro D, has been specifically made for Deutsche Bahn AG, a German railway company jointly owned by the German state. The first four trains of the new ICE 3 model were delivered in December 2013. Velaro models have been put into use in countries from China to Great Britain. The Velaro D operates with 20 percent higher energy efficiency than its predecessors due to higher aerodynamic efficiency and has a maximum speed of 200 miles per hour. It is also the first train for Deutsche Bahn with wheelchair lifts on both sides.

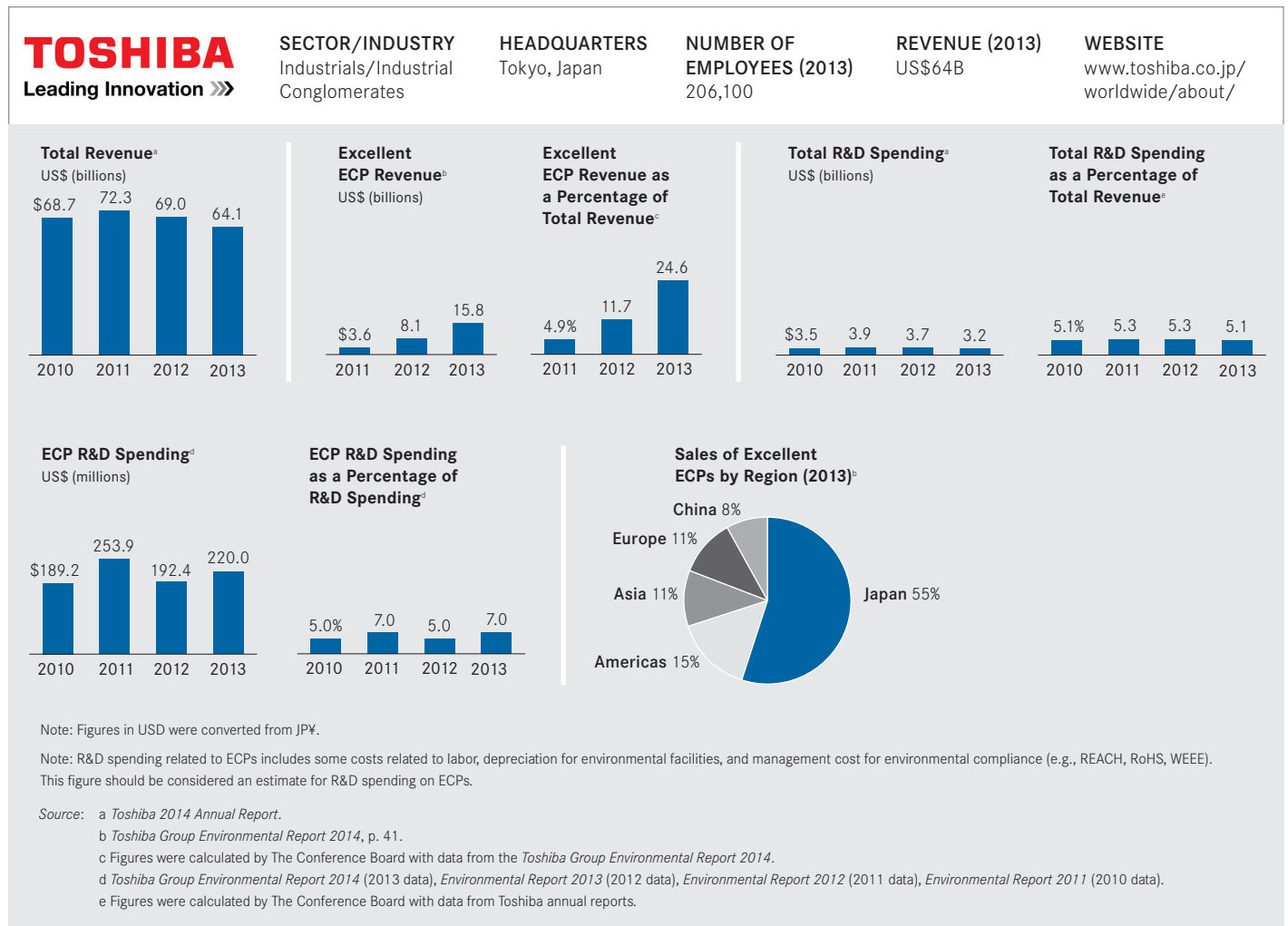
COMPANY PROFILE

Toshiba Corporation

COMPANY BACKGROUND

Toshiba Corporation channels world-class capabilities in advanced electronic and electrical product and systems into five strategic business domains: energy & infrastructure, community solutions, healthcare systems & services, electronic devices & components, and

lifestyles products & services. Founded in Tokyo in 1875, today's Toshiba is at the heart of a global network of over 590 consolidated companies employing over 200,000 people worldwide.



“By achieving a very high level of environmental performance in our products and by developing low-carbon power sources, we are meeting a demand (a need) that people, businesses, and governments require to mitigate climate change, manage chemicals, and reduce resource consumption. We use a strategic approach which includes the development of localized products and technologies. These products are designed for minimal environmental impact based on an understanding of the specific or individualized need of a country or area of the world. This includes products and technologies with cutting-edge features for developed countries as well as those appropriate for developing countries, where the impact on the environment is likely to increase as a result of economic growth.”

Craig Hershberg, Director, Environmental Affairs, Toshiba America

REVENUE FROM ENVIRONMENTALLY CONSCIOUS PRODUCTS

Toshiba’s Environmentally Conscious Products (ECPs) are products which are designed to have minimum environmental impact during their entire life cycle. To qualify as an ECP, a product is reviewed based on the following three criteria:

- Mitigation of climate change (e.g. energy usage and efficiency)
- Efficient use of resources (e.g. reduced raw material usage)
- Management of chemicals (e.g. reduced usage of hazardous substances)

Toshiba further segments products as “Excellent ECPs,” i.e. products which the company considers to have among the highest levels of environmental performance in the industry at the time of their release to the market. Sales of “Excellent ECPs” rose from US\$3.6 billion in 2011 to US\$15.8 billion in 2013, a 342 percent year-over-year increase in three years.* This growth has been driven both by a general increase in sales of existing “Excellent ECPs” and an increase in the number of products designated as “Excellent ECPs.” By comparison, total company revenue

increased by 8 percent over the same period. Sales of “Excellent ECPs” accounted for 25 percent of Toshiba’s revenue in 2013.

R&D SPENDING ALLOCATED TO ENVIRONMENTALLY CONSCIOUS PRODUCTS

Toshiba’s total R&D spending in 2013 amounted to US\$3.2 billion, or about 5 percent of total revenue. The total R&D spending related to the company’s ECPs came to US\$220 million in 2013, or about 7 percent of overall R&D spending.† The share of R&D spending related to ECPs in 2013 increased by about 25 percent over 2010 spending. Future environmental R&D investments will be targeted to advancing research in technologies for saving energy, reducing use of resources, and chemical management.

GOVERNANCE

In 2007, Toshiba announced “Environmental Vision 2050,” Toshiba’s view of the world in 2050, where the company’s technological advancements and sound environmental principles would promote a comfortable standard of living and a sustainable planet for future generations. To achieve this vision, Toshiba is taking a product life cycle approach to develop products that are safer, have a reduced impact on the environment, and provide customers with more comfortable lifestyles.

* Figures are converted to USD from original JPY values as reported in Toshiba’s Annual Report and Environmental Report. Currency equivalents were calculated using the yearly average currency exchange rates of the US Internal Revenue Service, <http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates>.

† R&D spending related to ECPs also includes some costs related to labor, depreciation for environmental facilities, and management cost for environmental compliance (e.g. REACH, RoHS, WEEE). This figure should be considered a rough reference for R&D spending on ECPs.

As part of the strategy to achieve this vision, Toshiba develops environmental action plans and manages specific environmental activities and targets in accordance with these plans. Since the company created its first environmental action plan in 1993, Toshiba has expanded its scope of environmental activities and governance.

In 2012, Toshiba introduced the company's fifth environmental action plan, covering the period from FY2012 to 2015, which established specific environmental performance goals across the following "4Greens" initiatives:

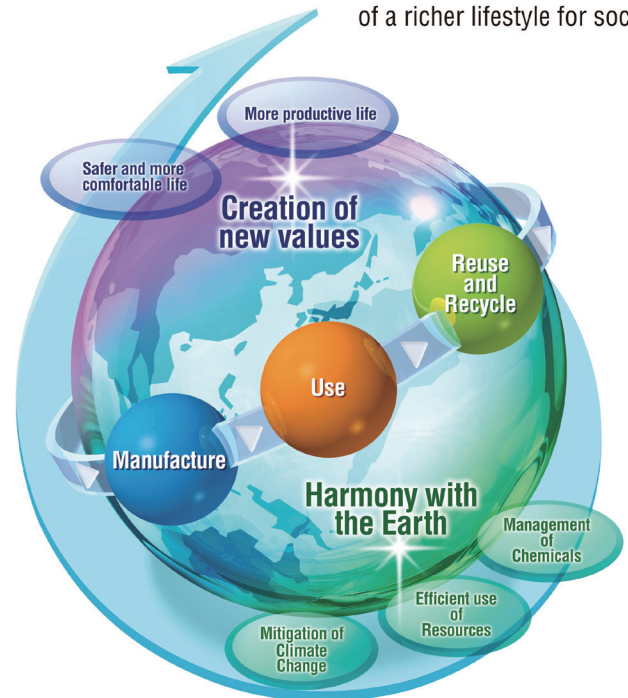
- Greening of Products focuses on improving the environmental performance of products. As part of Toshiba's ECP process, the company establishes targets for environmental standards and then incorporates them into product specification. Products that do not meet Toshiba's minimum ECP standards are not shipped. This initiative also includes developing "Excellent ECPs." Toshiba set a goal to achieve US\$18 billion in annual sales from "Excellent ECPs" in FY2015. The company also calculates the degree of improvement of its products' eco-efficiency, calculated as the ratio between the value of a product and its environmental impact. By FY2015, Toshiba aims to increase the average environmental efficiency of the company's products to 3.40 times the base level of 1.00 in FY2000.
- Greening by Technology focuses on developing and advancing low-carbon power technology, including nuclear power and thermal power.
- Greening of Process focuses on improving the environmental impact of the company's operations.
- Green Management focuses on increasing human resources for environmental initiatives, improving the company's environmental management system, and enhancing stakeholder communication

In 2013 Toshiba introduced the company's environmental management concept, T-COMPASS, which uses the four cardinal compass points (North, South, East, and West) to focus the company's initiatives on environmental issues of high priority:

- Minimize natural resource consumption.
- Respond to energy issues and climate change.
- Minimize chemical substance risk.
- Minimize water consumption.

Environmental Vision 2050

Toshiba Group practices environmental management that promotes harmony with the Earth, contributing to the creation of a richer lifestyle for society.



In Their Words...

Q: What was the primary motivation for embarking on your sustainable products initiative? How did it get started?

A: Social demand for a zero-waste society became bigger and bigger in the early 1990s, as evidenced by the results of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. Since 1993, Toshiba has been determined to meet this demand by developing sustainable products through the use of life cycle assessment.

Q: What has been your biggest sustainable products success story? What contributed to this success?

A: The Portege R500 notebook PC was one of Toshiba's first "Excellent ECPs" when it was announced in 2007. This was followed by the R600 notebook PC the following year, which featured a number of environmental improvements over previous versions, including:

- Lower power consumption through adoption of a low voltage unit
- Reduced material usage through downsizing of the circuit board
- A mercury-free LED back light
- A 47 percent reduction in life cycle CO₂ emissions compared with the 2000 model

After the early success of the Portege R500 and R600, Toshiba continues to release Portege R series as flagship models with improved environmental profiles, such as PVC-free charging cables and halogen and antimony-free printed wiring boards.



Kiyoshi Sanehira
General Manager of Corporate
Environment Management Office
Toshiba

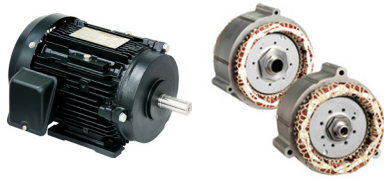
Q: What has been the biggest challenge to your sustainable products strategy?

A: Our biggest challenge is to continue producing additional Excellent ECPs. To meet this challenge, we continuously set eco-targets and incorporate these targets into our product specifications in the business strategy formulation and product planning stages. This process results in the development of products with some of the highest levels of environmental performance. Of course, designing our products to meet the eco-targets can sometimes be challenging as well, considering the inevitable trade-offs between cost and design.

Q: What advice would you give to another company going down this path?

A: Get the agreement of your CEO to jump-start and accelerate your environmental activities.

Product Examples



Premium Gold Motor™ Examples of “Excellent ECPs” in Toshiba’s energy & infrastructure business include the Premium Gold Motor™, which has the small iron core size and high efficiency of an IE3 (premium efficiency class) motor and hybrid electric vehicle motors, which show high energy-saving performance for maximum motor efficiency and power density.



Vantage Elan™ An example of an “Excellent ECP” in Toshiba’s healthcare business is the Vantage Elan™ MRI system, which features the lowest power consumption in its class (at the time of release), compared to alternatives. Other advantages include reduced noise, reduced bulk for less material use and easier installation, and 50 percent reduced peak power consumption compared to its peers.



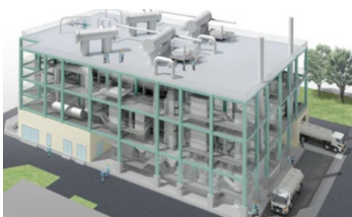
SCiB™ Toshiba’s SCiB™ is a rechargeable battery with superb safety that offers outstanding features that suit a wide range of potential applications. The battery has features that make it highly suited for automotive applications, including rapid charge times and a long battery life. The SCiB™ charges in about half the time of a typical Li-ion battery, and the full charge-discharge cycle for the battery is over three times that of other Li-ion batteries, greatly extending the potential for reuse of the battery.



TCxWave Toshiba’s TCxWave POS system is one of the company’s “Excellent ECPs.” In addition to features such as multiple configuration options (POS, kiosk, or self-service) and smart touch technology, the TCxWave system is designed to be energy efficient. The system features solid state drive (SSD) technology, which runs cooler than hard disk drives and draws less power. It also features deep sleep automation, which puts the system into a low-power mode, conserving almost as much energy as an off-state, and uses ultra-low volt mobile processors to increase energy efficiency. The screen’s LED backlight is also mercury-free.



Geothermal Power Toshiba’s flash geothermal power generation systems have helped the company become a global market share leader in total generating capacity. Globally, Toshiba has supplied 52 geothermal power generation systems with a combined capacity of 3,400 MW.



Sewage Sludge to Fuel Toshiba’s sewage sludge to fuel systems convert waste sludge to fuel that can be used as a substitute for coal and other fossil fuels. They also help reduce the environmental effects of treating sewage, as these systems emit about 80 percent less carbon dioxide than traditional systems (at the time of release).

For more details on Toshiba’s “Excellent ECPs” visit:
www.toshiba.co.jp/env/en/products/ecp.htm

Appendix

Revenue Data

TABLES 1.1, 1.2, 2.1, 2.2, AND 2.6

CHARTS 1.1, 1.2, 2.1, AND 2.2

Allianz (revenue from “Green Solutions”): Allianz Sustainability Report 2014, p. 3 (2014 and 2013 data).

BASF (revenue from “climate protection products”): BASF Report 2013 (2013 and 2012 data); BASF Report 2012 (2011 data); BASF Report 2011 (2010 data).

Caterpillar (revenue from “Sustainable Progress” portfolio): Email communication, November 24, 2014 and April 8, 2015.

Dow Chemical (revenue from “products highly advantaged by sustainable chemistry”): 2013 Annual Sustainability Report, p. 12.

DuPont (revenue from “products that reduce GHG emissions”): 2014 DuPont Sustainability Progress Report (2013 data); 2013 DuPont Sustainability Progress Report (2012, 2011, 2010 data).

GE (revenue from “Ecomagination”): Email communication, April 20, 2015 (2014, 2013, and 2012 data); GE Ecomagination Report 2011 (2011 data); GE Ecomagination Report 2010 (2010 data).

Johnson & Johnson (revenue from “Earthwards®” portfolio): Johnson & Johnson Citizenship & Sustainability web site (<http://www.jnj.com/caring/citizenship-sustainability/strategic-framework/our-strategy-and-approach>) (2014 data); 2013 Citizenship & Sustainability Report, p. 70 (2013 data).

Kimberly-Clark (revenue from “ecoLOGICAL” portfolio): 2013 Sustainability Report (2013, 2012, and 2011 data); 2010 Sustainability Report (2010 data).

Panasonic (revenue from “Superior Green Products”): Panasonic Sustainability Report 2014, p. 40 (2014 data); Panasonic Sustainability Report 2013, p. 35 (2013, 2012, and 2011 data).

Philips (revenue from “Green Products”): Philips Annual Report 2014. p. 40.

Siemens (revenue from “Environmental Portfolio”): Siemens Annual Report 2014 (2014 and 2013 data); Siemens Annual Report 2013 (2012 data); Siemens Annual Report 2012 (2011 data); Siemens Annual Report 2011 (2010 data).

Toshiba (revenue from “Excellent ECPs”): Toshiba Group Environmental Report 2014, p. 41.

Alternative Fuel Vehicle Sales Data

TABLES 2.3, 2.4, AND 2.5

Ford

2013 data: John Voelcker, “Ford Hybrid Sales: So Far, Not Hurt by All Those MPG Reductions, Green Car Reports, September 5, 2014 (www.greencarreports.com/news/1094235_ford-hybrid-sales-so-far-not-hurt-by-all-those-mpg-reductions).

2012 – 2010 data: “Ford Sees Surge in U.S. Hybrid Sales on Way to Annual Record,” Automotive News, January 30, 2013 (www.autonews.com/article/20130130/RETAIL01/301309722/ford-sees-surge-in-u.s.-hybrid-sales-on-way-to-annual-record).

Honda

2013 data: Roger Schreffler, “Toyota Strengthens Grip on Japan EV, Hybrid Market,” WardsAuto, March 7, 2014 (<http://wardsauto.com/vehicles-amp-technology/toyota-strengthens-grip-japan-ev-hybrid-market>).

2012 data: “Honda Challenges Toyota for First Position in Hybrid Market,” Electric Vehicles Research, October 10, 2013 (www.electricvehiclesresearch.com/articles/5880/honda-challenges-toyota-for-first-position-in-hybrid-market).

2011 data: “Cumulative Worldwide Sales of Honda Hybrid Vehicles Reaches 1 Million Units,” Honda, October 15, 2012 (<http://world.honda.com/news/2012/c121015Hybrid-Vehicles-Reaches-1-Million-Units/>).

2010 data: Roger Schreffler, “Hybrid, EV Sales Lag Forecasts, but Plenty More Models on Way,” WardsAuto, November 29, 2011 (http://wardsauto.com/ar/hybrid_ev_lag_111129).

Nissan

2013 data: “Renault-Nissan Alliance Posts Record Sales in 2013,” Renault-Nissan, February 7, 2014 (www.media.blog.alliance-renault-nissan.com/news/renault-nissan-alliance-posts-record-sales-in-2013/).

2012 data: “Renault-Nissan Alliance Posts Sales Record in 2012 for 4th Straight Year,” Renault-Nissan, February 4, 2013 (www.nissan-global.com/EN/NEWS/2013/_STORY/130204-02-e.html).

2011 data: “Renault-Nissan Alliance Posts Record Sales in 2011 for Third Consecutive Year,” Renault-Nissan, February 1, 2012 (www.nissan-global.com/EN/NEWS/2012/_STORY/120201-03-e.html).

Toyota

2013 – 2010 data: “Worldwide Sales of Toyota Hybrids Top 6 Million Units,” Toyota, January 14, 2014 (<http://corporatenews.pressroom.toyota.com/releases/worldwide+toyota+hybrid+sales+top+6+million.htm>).

Overall Vehicle Sales Data

TABLES 2.4 AND 2.5

Ford

2012 – 2013 data: Ford 2014 Annual Report, p. 6 (http://corporate.ford.com/annual-reports/annual-report-2014/files/201_Ford_Annual_Report_sm.pdf).

2011 data: Ford 2012 Annual Report, (<http://corporate.ford.com/content/dam/corporate/en/investors/reports-and-filings/Annual%20Reports/2012-annual-report.pdf>).

2010 data: Ford 2011 Annual Report, (<http://corporate.ford.com/content/dam/corporate/en/investors/reports-and-filings/Annual%20Reports/2011-annual-report.pdf>).

Honda

2010 – 2013 data: Honda corporate web site, “Business Segment Information,” (http://world.honda.com/investors/financial_data/segment/).

Nissan

2010 – 2013 data: Nissan corporate web site, “Financial Highlights,” (<http://www.nissan-global.com/EN/IR/INDIVIDUAL/RESULTS/>).

Toyota

2010 – 2013 data: Toyota corporate web site, “Financial Highlights,” (http://www.toyota-global.com/investors/financial_data/high-light.html).

R&D Data

TABLES 1.3, 2.7, 2.8, AND 2.9

CHARTS 1.3, 2.4, AND 2.5

BASF (product and process innovations where the R&D target is related to resource efficiency and climate protection): <https://www.basf.com/en/company/sustainability/environment/energy-and-climate-protection/our-climate-protection-solutions.html>.

Daimler (green technologies R&D): Daimler 2014 Annual Report (<http://ar2014.daimler.com/management-report/sustainability/research-and-development>).

DuPont (environmental R&D investment for new product development; excludes environmental R&D investment devoted to process improvements): Email communication, December 9, 2014 (2013 data); DuPont 2013 Sustainability Progress Report, p. 8 (2012, 2011, and 2010 data).

GE (Ecomagination R&D): Email communication, April 20, 2015 (2014, 2013, and 2012 data); GE Ecomagination Report 2011 (2011 data); GE Ecomagination Report 2010 (2010 data).

Nissan (environmental technologies R&D): (<http://www.nissan-global.com/EN/REPORTS/2011/10/111024-02.html>).

Philips (Green innovation R&D): Philips Annual Report 2014, p. 38.

Siemens (Environmental Portfolio R&D): <http://www.siemens.com/press/pool/de/events/2012/corporate/2012-03-patent/factsheet-fe-en.pdf>.

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