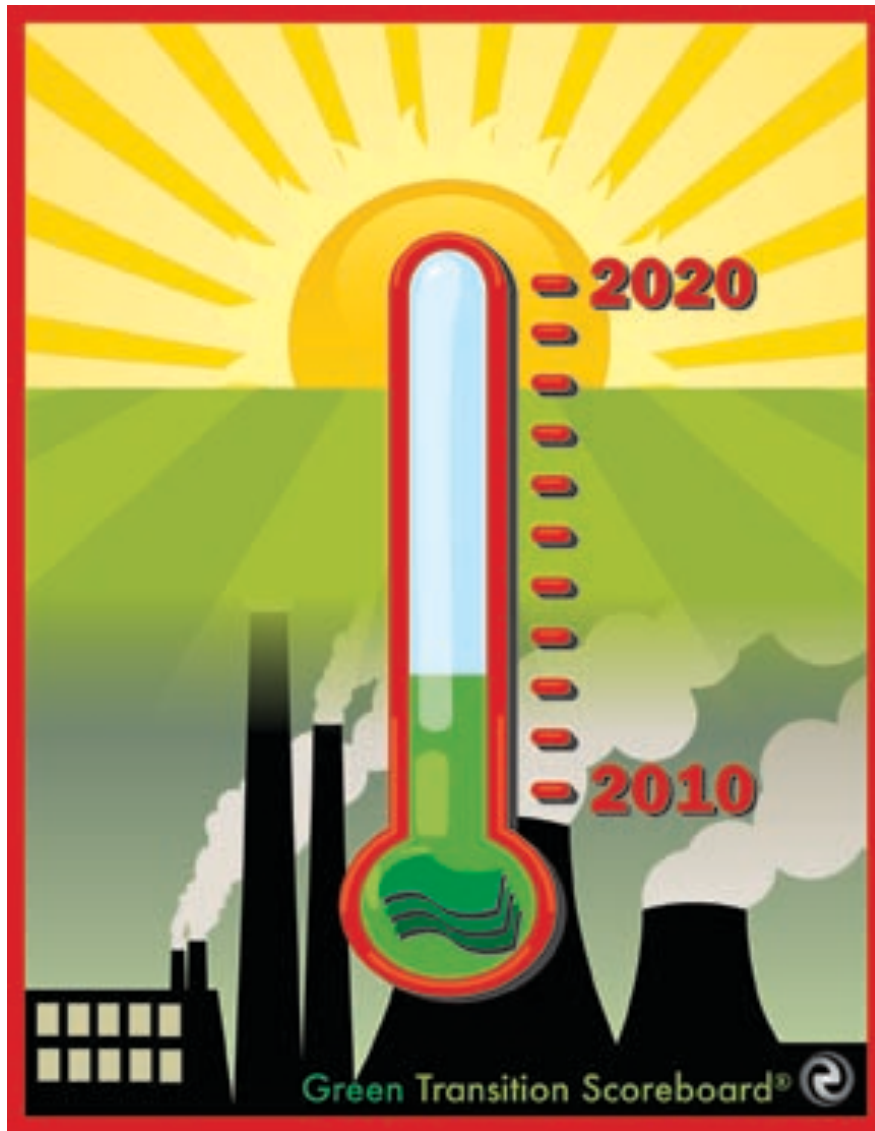


# Ethical Markets Global Green R&D Report



Supplement to the Green Transition Scoreboard®  
August 2012

Prepared by Timothy Jack Nash  
and Ethical Markets Media Research Team

## Introduction

Since 2007, the Green Transition Scoreboard® has tracked private investments in creating cleaner, greener economies globally. If we continue to invest at least \$1 trillion per year until 2020, we will be leaving the fossil fueled industrial era and entering a new solar age<sup>1</sup> based on principles of equity, sustainability, and biomimicry.<sup>2</sup> This green transition is happening at an extraordinary rate, accelerated by international agreements in 2012 by the G-20, Rio+20, OECD, UNDP and the United Nations General Assembly. This supplement to the [February 2012 report](#)<sup>3</sup> focuses on investments that companies are making in green research and development (R&D).

To put the R&D findings in context, as of July 2012, \$3.6 trillion has been privately invested in a greener, global economy since 2007. The Green Transition Scoreboard® (GTS) tracks investments in Renewable Energy, Green Construction, Smart Grid, Energy Efficiency, Cleantech and R&D. Of these, R&D accounts for 6.7% of the total GTS at the end of Q2 2012, greater than Smart Grid, Energy Efficiency or Cleantech.

Sector	Amount (USD)
Renewable Energy	\$2,002,049,000,000
Green Construction	\$716,450,000,000
Green R&D	\$241,759,000,000
Smart Grid	\$238,493,000,000
Energy Efficiency	\$231,032,000,000
Cleantech	\$188,332,000,000
<b>TOTAL</b>	<b>\$3,618,115,000,000</b>

Research & development investments are key to growing the green economy. They are resulting in new products that meet human needs, while minimizing the impact on our

---

<sup>1</sup> Henderson, Hazel. *Politics of the Solar Age*, Doubleday, 1981, 1988.

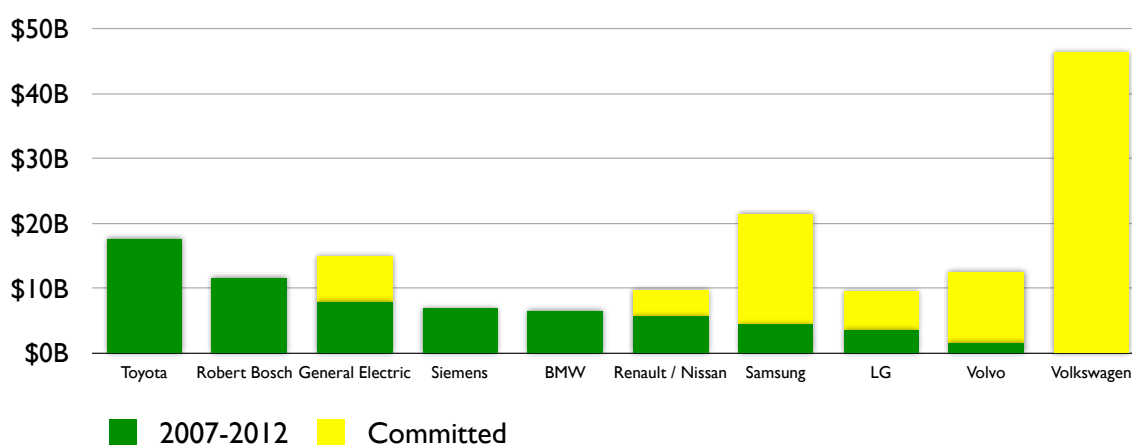
<sup>2</sup> The discipline of biomimicry studies nature's best ideas and then imitates these ecological designs and processes to solve human problems. Benyus, Janine. *Biomimicry: Innovation Inspired By Nature*, William Morrow, 1997.

<sup>3</sup> "Green Transition Scoreboard® 2012: From expanding cleantech sectors to emerging trends in biomimicry," Ethical Markets Media, February 2012.

natural environment. Significant investments in green R&D symbolize that a company has integrated sustainability into its core strategy. It serves as a strong indicator for investors who are betting on increasing consumer demand for green products. Additionally, this data helps identify innovative companies who are ahead of the curve in responding to heightening environmental risks and regulations.<sup>4</sup>

The data collected for this supplement is the most comprehensive assessment of corporate green R&D performed to date. Our research team scoured press releases, sustainability reports, and financial statements to identify 165 companies who are responsible for more than \$241 billion in green R&D. We believe this amount understates by half global R&D private investments, once you consider unreported R&D for competitive reasons, international companies' R&D not making it into the media or required to report, and the tens of thousands of middle-market and smaller companies with R&D budgets below reporting thresholds.

## Top 10 Companies Investing in Green R&D



Our definition of 'green' is quite strict, omitting areas such as clean coal, carbon capture & sequestration, and biofuels from feedstock other than sea-grown algae. We are also looking closely at nanotech, bioengineering and 3D printing, determining their green contribution on a case by case basis.

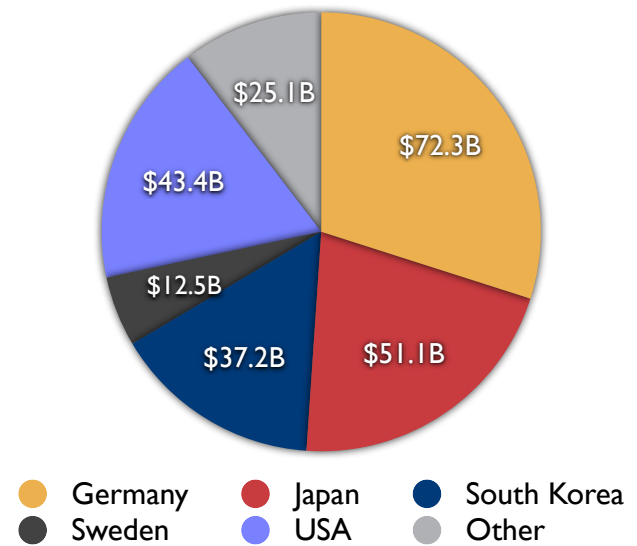
<sup>4</sup> See for example, "Through the Looking Glass: how investors are applying the results of the climate change scenario study," Mercer, LLC, New York, 2012; Deutsche Bank, "Sustainable Investing: Establishing Long-Term Value and Performance," DB Climate Change Advisors, June 2012.

## Country Data

German firms are leading the way when it comes to green R&D. This leadership is in large part due to automotive manufacturers such as Volkswagen, Robert Bosch, and BMW who are all investing heavily into electric cars. Additionally, strong government support for renewable energy has led companies such as Siemens to invest heavily into smart grid technologies. We are following the debates regarding the effectiveness of metering and the trend toward micro-grids.

Country	# of Companies	Amount (USD)
Germany	9	\$72,298,096,318
Japan	26	\$51,060,708,602
USA	47	\$43,408,972,000
South Korea	11	\$37,224,822,640
Sweden	1	\$12,524,800,000
France	6	\$6,475,233,375
Taiwan	12	\$4,826,081,864
Netherlands	2	\$4,237,541,100
China	23	\$2,919,370,658
Brazil	3	\$1,637,210,224
Spain	4	\$1,013,368,265
UK	2	\$866,397,244
Denmark	1	\$834,028,000
Belgium	2	\$740,721,117
Finland	2	\$549,852,355
Canada	5	\$411,803,970
Switzerland	1	\$230,650,185
Norway	1	\$201,399,408
India	2	\$110,790,784
Chile	1	\$77,760,000
Mexico	1	\$53,000,000
Austria	1	\$37,822,200
Greece	1	\$15,953,210
Israel	1	\$2,550,000
<b>TOTAL</b>	<b>165</b>	<b>\$241,758,933,519</b>

## Green R&D by Country



Japan is also home to a large number of leading-edge automotive companies like Toyota and Mitsubishi. Meanwhile, Japanese electronic firms like Panasonic, Sharp and NEC are recognizing the huge potential of green products, and are investing heavily in this area. Additionally, our researchers were able to capture many smaller investments due to strong environmental accounting standards required of Japanese companies by their government.

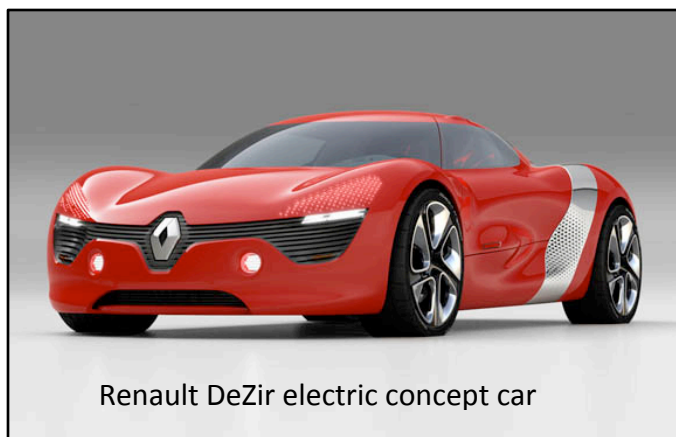
There are many Chinese companies investing in green R&D, although the amounts invested tend to be quite low. The low figure is in large part due to the state control of many large Chinese firms investing in green R&D such as Dongfeng Motor

Corporation and State Grid Corporation of China. State-controlled companies have been omitted because the GTS only counts private investments.

The USA is the official domicile of a large number of innovative firms, even though some of their R&D is conducted in other countries. Large USA-domiciled corporations such as GE and IBM are shifting their strategy in a more sustainable direction. Additionally, the USA hosts dozens of smaller pure-play green companies, such as Cree Inc. and Maxwell Technologies, who are betting solely on rising demand for green products.

### Sector Data

By far the largest investor in green R&D is the automotive industry. The auto sector is more research intensive than other sectors, with many companies spending more than 5% of revenues on R&D.<sup>5</sup> From a marketing perspective, companies are competing to release the newest, greenest model. Toyota was the earliest adopter, spending billions developing their Prius line of hybrids. However, the field is getting crowded. The Renault / Nissan alliance announced a [€4 billion push towards zero-emission mobility](#) that started with the Nissan Leaf, and is now expanding into other vehicle classes.<sup>6</sup> More recently, Volkswagen declared that 2013 will be the year of electromobility and announced that they will [invest upwards of €76.4 billion](#) on R&D of efficient vehicles and greening their production sites by 2016.<sup>7</sup> Based on the trends we see reported, we foresee 50% or more of this amount will be spent developing electric vehicles. Although the sector total of \$133.5 billion is quite impressive, it does not capture the entire amount. Many automobile companies, such as GM and Daimler, do not publicly disclose how much of their R&D investments are directed towards hybrid and/or electric vehicles.



Renault DeZir electric concept car

The semiconductor sector is the next largest investor in green R&D. Small-cap solar panel manufacturers are battling to reduce the cost and increase the efficiency of solar power.

---

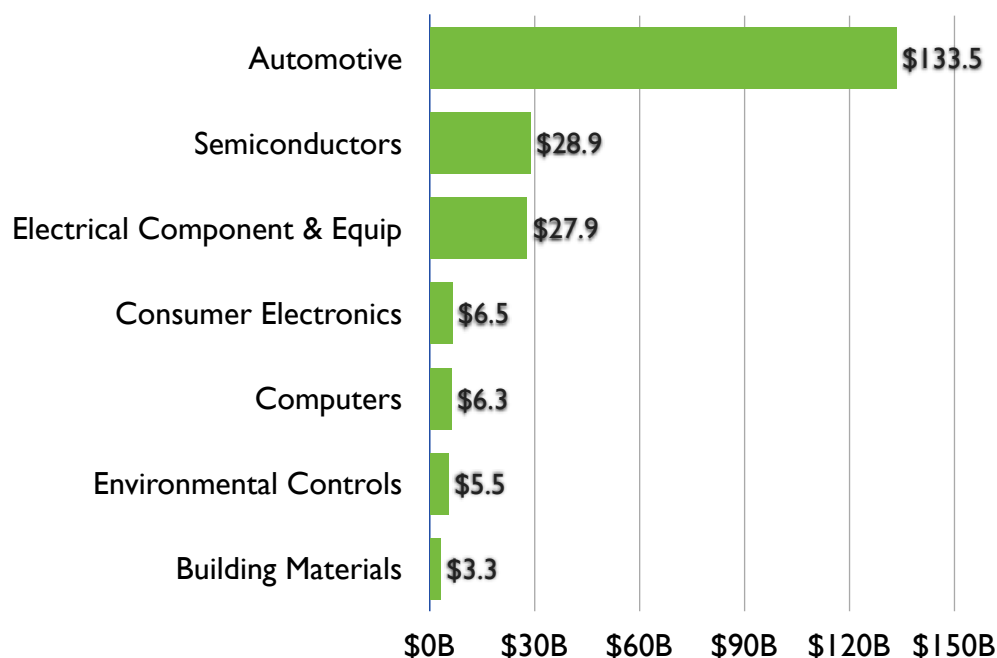
<sup>5</sup> Deutsche Bank Research. "Capital Markets Reward R&D," June 30, 2011.

<sup>6</sup> Squatriglia, Chuck. "Renault-Nissan CEO Pledges \$5.6 Billion for EVs," *Wired*, June 16, 2011.

<sup>7</sup> "New Sustainability Objectives," Volkswagen Sustainability Report 2011.

Recently, the industry reached the monumental goal of developing silicon modules at a cost of [\\$1 per watt](#) of capacity.<sup>8</sup> Meanwhile, large firms such as Samsung are [investing billions](#) in developing organic light emitting diodes (OLEDs), which drastically improve the energy efficiency of lighting displays.<sup>9</sup> Not counted in this report are the many small companies like Natcore Technology and Pantheon Chemical with products which have yet to come to market.

## Green R&D by Sector



Electrical components and equipment refers mostly to smart grid technologies. Although it is possible that Smart Grids are serving industrial-era utilities rather than the green economy, the GTS continues to count investments which include smart meters and 2-way power transmission (crucial for large-scale deployment of renewable energy) from firms such as Itron, Hitachi, and Legrand. This sector also includes investments in batteries for electric vehicles and charging infrastructure.

---

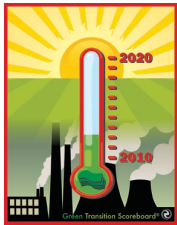
<sup>8</sup> Roston, Eric. "Solar Silicon Price Drop Brings Renewable Power Closer," Bloomberg.com, March 13, 2012.

<sup>9</sup> "The Next Big Bet," *The Economist*, October 2011.

## Conclusion

Companies around the world are recognizing a tremendous opportunity as we evolve from a dirty fossil fuel-based economy into a cleaner, greener future. Major investment in green R&D from large corporations is evidence of a management bet on increasing revenues from consumers who are demanding green products. For smaller companies who are purely focused on green industry, these investments illustrate the tremendous growth opportunity in green sectors.

Green Transition Scoreboard® Research Team:



HAZEL HENDERSON, D.Sc.Hon., FRSA, Founder and President, Ethical Markets Media, USA and Brazil

ROSALINDA SANQUICHE, MA, Executive Director, Ethical Markets Media, USA

TIMOTHY JACK NASH, MSc, Director of Sustainability Research, Ethical Markets Media; Principal, SSI – Strategic Sustainable Investments, Toronto, Canada

If you have questions about this research, including breakdowns of investments by company and year, please email [tim.nash@ethicalmarkets.com](mailto:tim.nash@ethicalmarkets.com).

For full disclosure: members of the research team and other principals of Ethical Markets Media, LLC, are invested in companies supporting the green transition, most of which are privately held, early stage, pre-IPO companies.

The Green Transition Scoreboard® and icon are trademarked by the USPTO. We license selected non-profit groups to carry our icon for information to their members.

© 2012

Ethical Markets Media (USA and Brazil)  
PO Box 5190, Saint Augustine, FL 32085  
Business 904.829.3140, fax 904.826.0325  
[office@ethicalmarkets.com](mailto:office@ethicalmarkets.com)  
Twitter @ethicalmarkets #greenscore

