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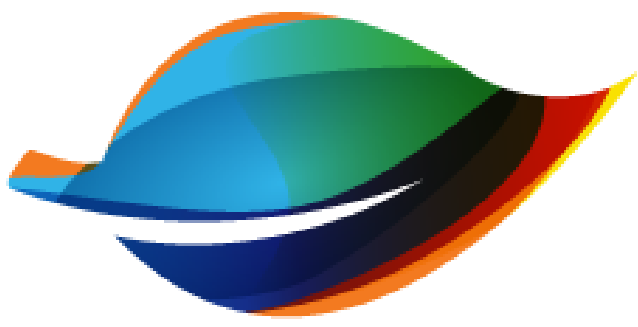

CleanTech PatentEdge℠

2013 ANNUAL REPORT

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All data in this report was provided by IP Checkups' CleanTech PatentEdge™ unless otherwise noted. CleanTech PatentEdge is the only patent-focused solution developed specifically to serve renewable energy, green materials, water treatment, and other clean technology industries.

CleanTech PatentEdge is an online database focused on patents and technology that have an effect on minimizing waste and pollution while reducing our environmental footprint.

There are now nearly 2,000,000 patent documents in CleanTech PatentEdge. These patents are sorted into over 150 market and technology categories, such as renewable energy generation (biofuels, wind, solar, etc.), energy storage, electric vehicles, water filtration, and desalination.

CleanTech PatentEdge includes data relevant to the following areas:

- Agriculture & Bioproducts
- Energy Efficiency
- Energy Storage
- Solar Energy
- Transportation
- Water & Waste Management
- Wind
- Geothermal
- Other Renewables

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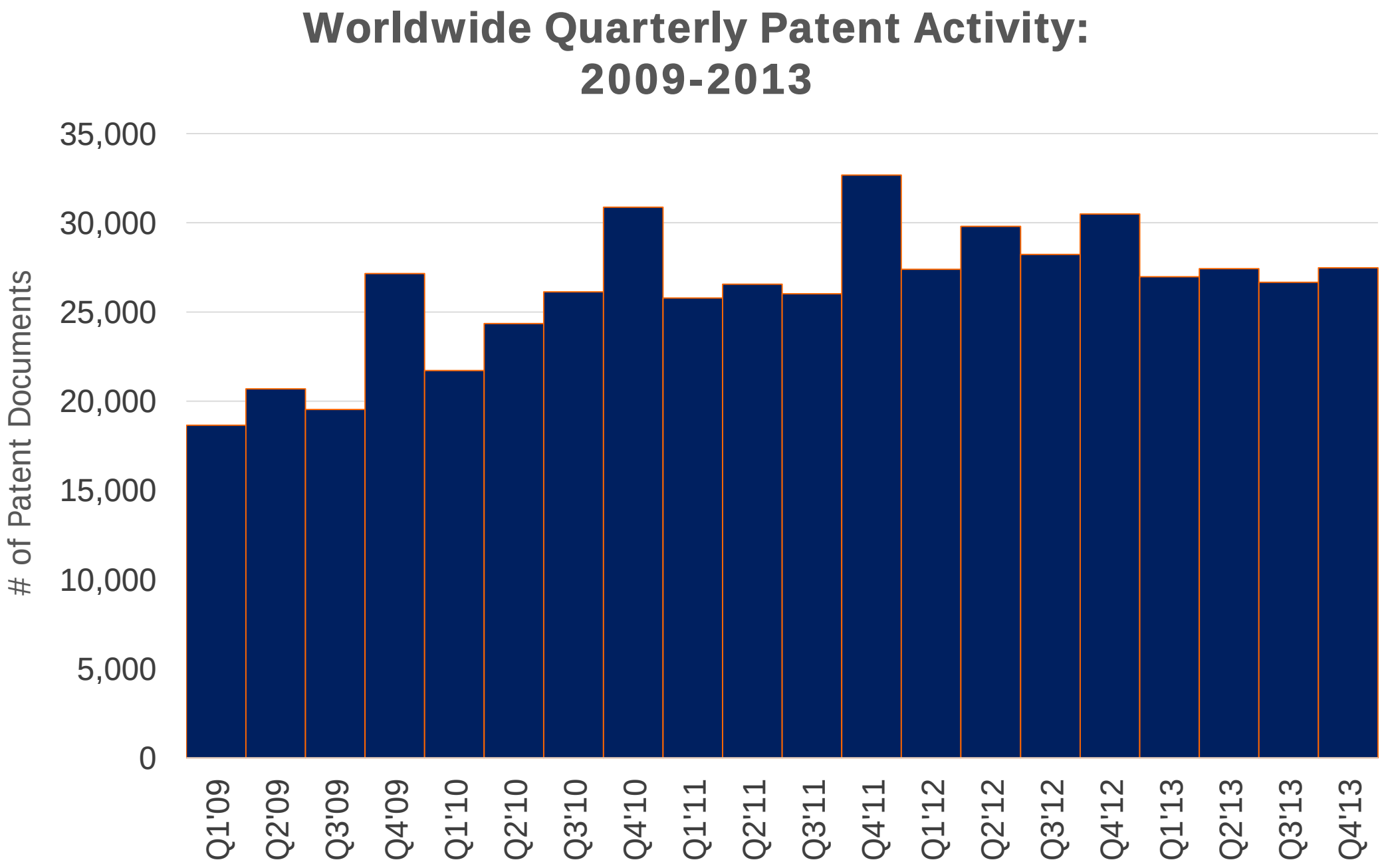
Cleantech Patenting Snapshot

There's still room for many innovations in cleantech; however, based on recent cleantech VC funding and patent publishing activity it is possible that the cleantech market is maturing.

- In the past decade, the number of granted cleantech patents has grown steadily. This trend has also been observed in most other industries.
- Both the number of published cleantech patent documents AND the dollar value of cleantech venture capital funding decreased in 2013.
- The total number of patents published in 2013 decreased by 6% YOY.
- The renewable energy generation and green material sectors continue to lead the cleantech industry, in terms of patenting.
- Cleantech VC funding declined by 53% YOY, from 2012 to 2013.

Worldwide Cleantech Patent Activity



- Worldwide* cleantech patent activity steadily increased from 2009-2012, but appears to have declined slightly in 2013.
- The highest level of patent publication activity consistently occurs in Q4**.

*DATASET INCLUDES U.S. PUBLISHED APPLICATIONS, U.S. GRANTED PATENTS, EUROPEAN (EP) PUBLISHED APPLICATIONS, EUROPEAN (EP) GRANTED PATENTS, WORLD INTELLECTUAL PROPERTY ORGANIZATION (WO) PUBLISHED APPLICATIONS

**PATENT APPLICATIONS TYPICALLY PUBLISH 18 MONTHS AFTER THEY ARE FILED.

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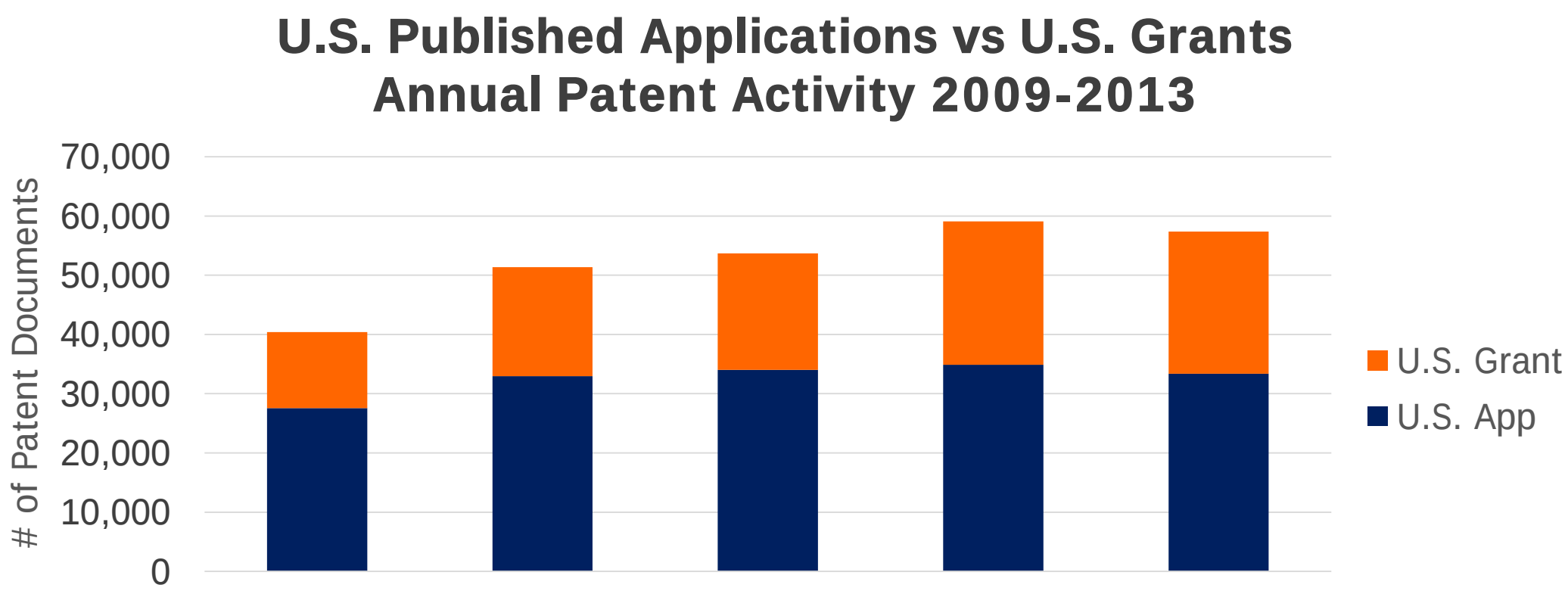
Cleantech Patent Activity in the U.S.



- In the past 5 years, approximately 1/3 of all cleantech patent publications were U.S. patent applications.
- In 2009, U.S. patent grants represented 16% of all worldwide cleantech patenting activity; by 2013, U.S. patent grants represented 22% of all worldwide cleantech patenting activity.

Year	**U.S. Published App** (% of Total Worldwide Cleantech Patent Activity)	**U.S. Grant** (% of Total Worldwide Cleantech Patent Activity)
2009	34%	16%
2010	33%	19%
2011	32%	19%
2012	30%	21%
2013	31%	22%

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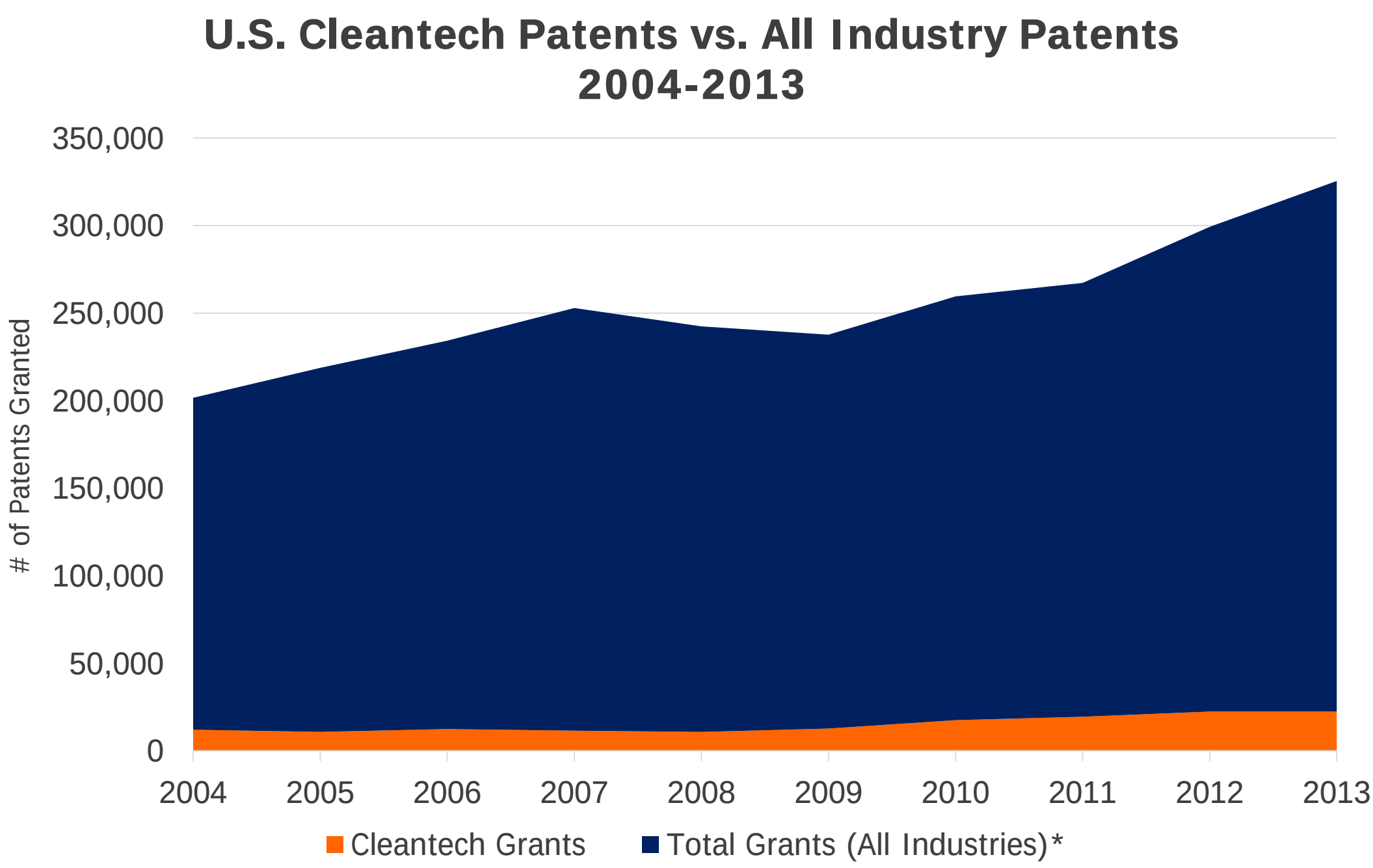
U.S. Granted Patent Trends



- Based on USPTO data, industry-wide granted patent activity within the past decade increased steadily in the U.S., despite a minor holding pattern during the last recession.
- CleanTech PatentEdge data shows that the compound annual growth rate of U.S. granted cleantech patents was 7.1% from 2004-2012, but stagnated for the first time in 10 years in 2013.

"CALENDAR YEAR PATENT STATISTICS (JANUARY 1 TO DECEMBER 31) GENERAL PATENT STATISTICS REPORTS AVAILABLE FOR VIEWING." *USPTO*. 3 FEB. 2014. WEB.

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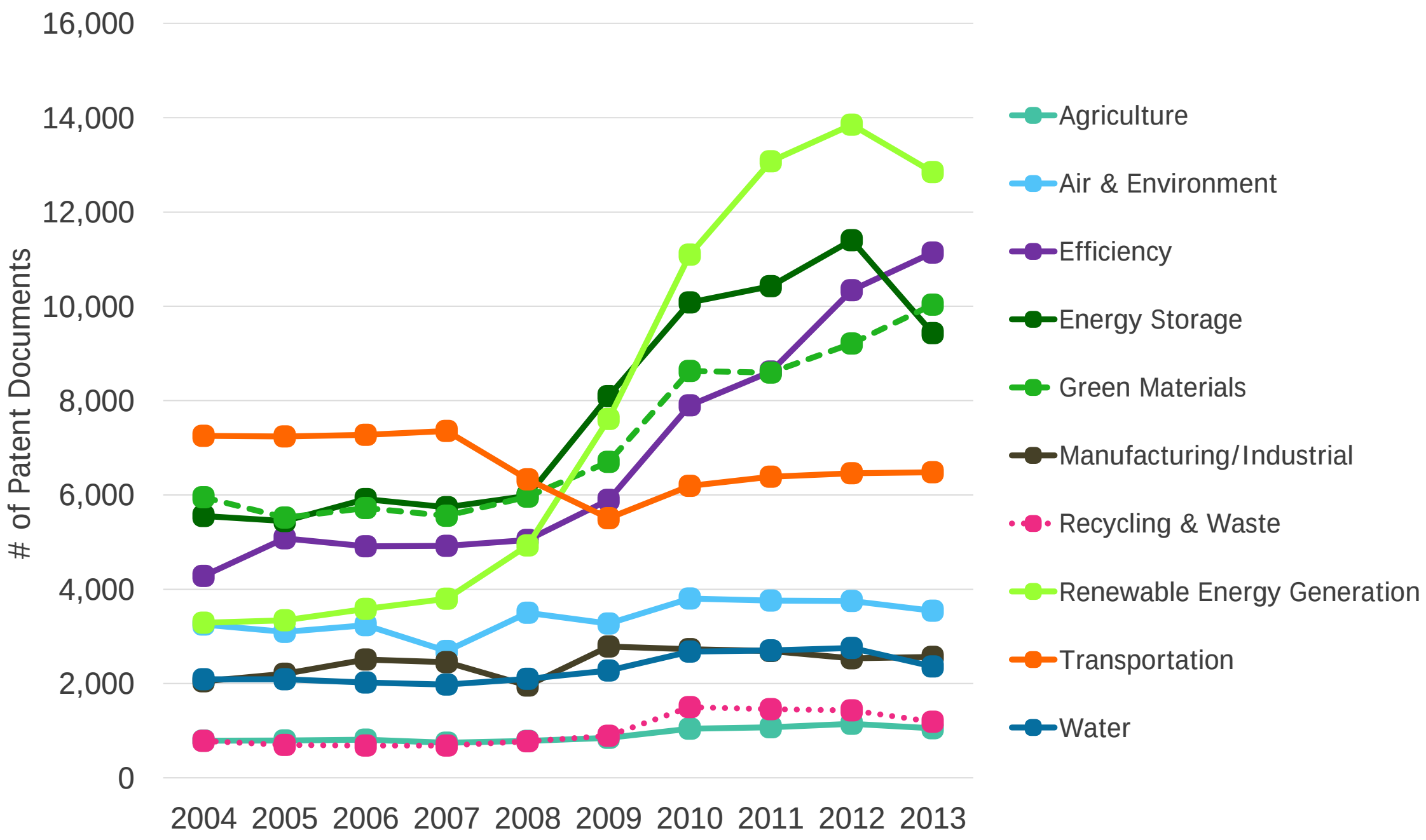
U.S. Patent Documents by Cleantech Industry Sector

- After reaching a peak in 2012, the annual number of U.S. patent publications declined slightly in 2013.
- Renewable Energy Generation is the leading industry sector in Cleantech. The overall evolution in Renewable Energy Generation patenting can be attributed to growth in the solar and biofuels industries.
- Patent activity in the Efficiency and Green Material sectors are on the rise.

U.S. Cleantech Patent Activity: 2004-2013



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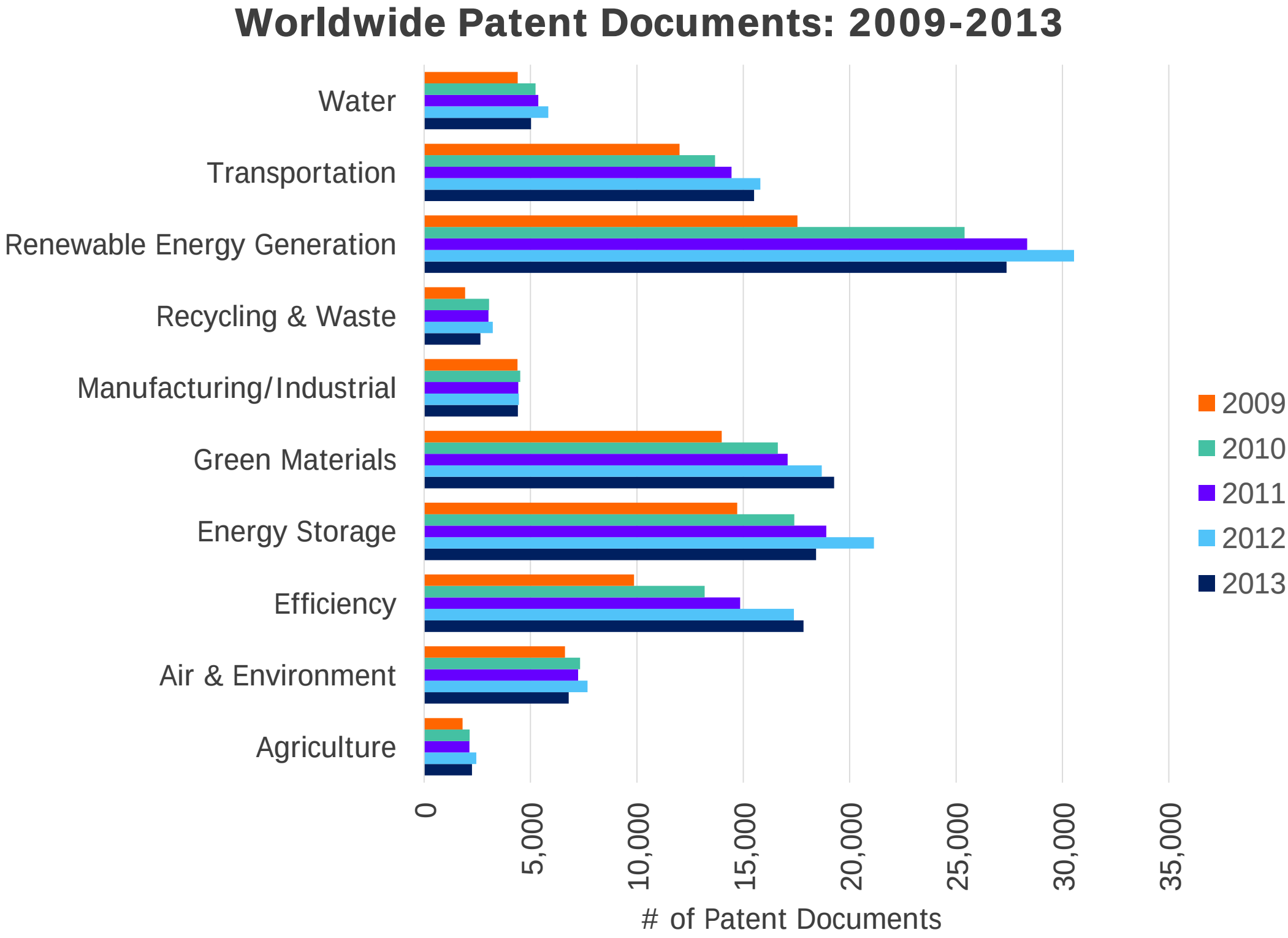
Innovation in Cleantech

LEADING SECTORS

Worldwide Cleantech Patent Activity by Industry Sector

- 50% of 2013 worldwide cleantech patent activity consisted of U.S. patent activity.
- During the past 5 years, patent activity has increased in CleanTech PatentEdge's Transportation, Renewable Energy Generation, Green Materials, Energy Storage, and Efficiency categories.
- Renewable Energy Generation remained the #1 cleantech sector in 2013.
- Largest YOY decline: Recycling & Waste (-18%), followed by Water (-14%)



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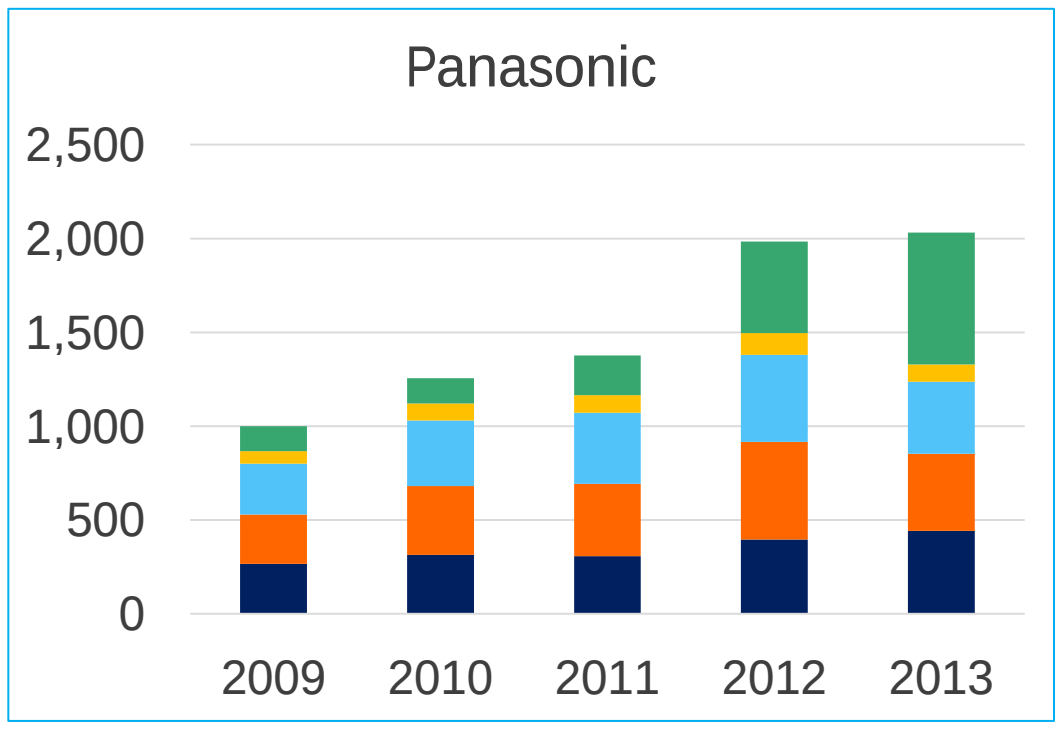
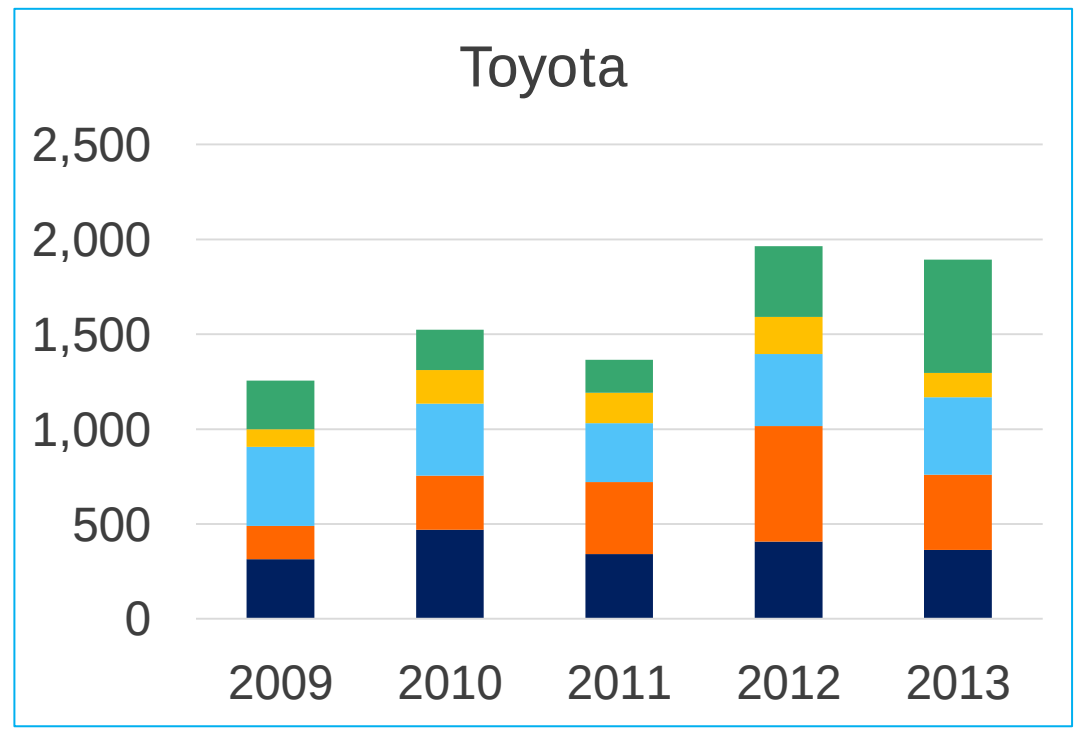
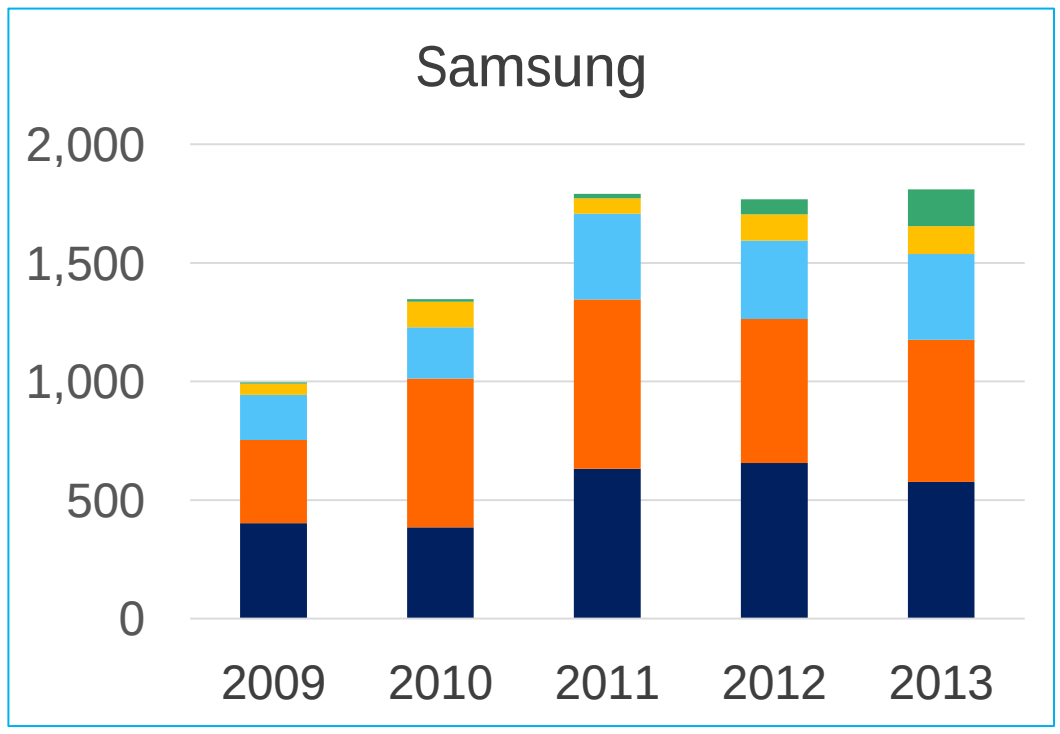
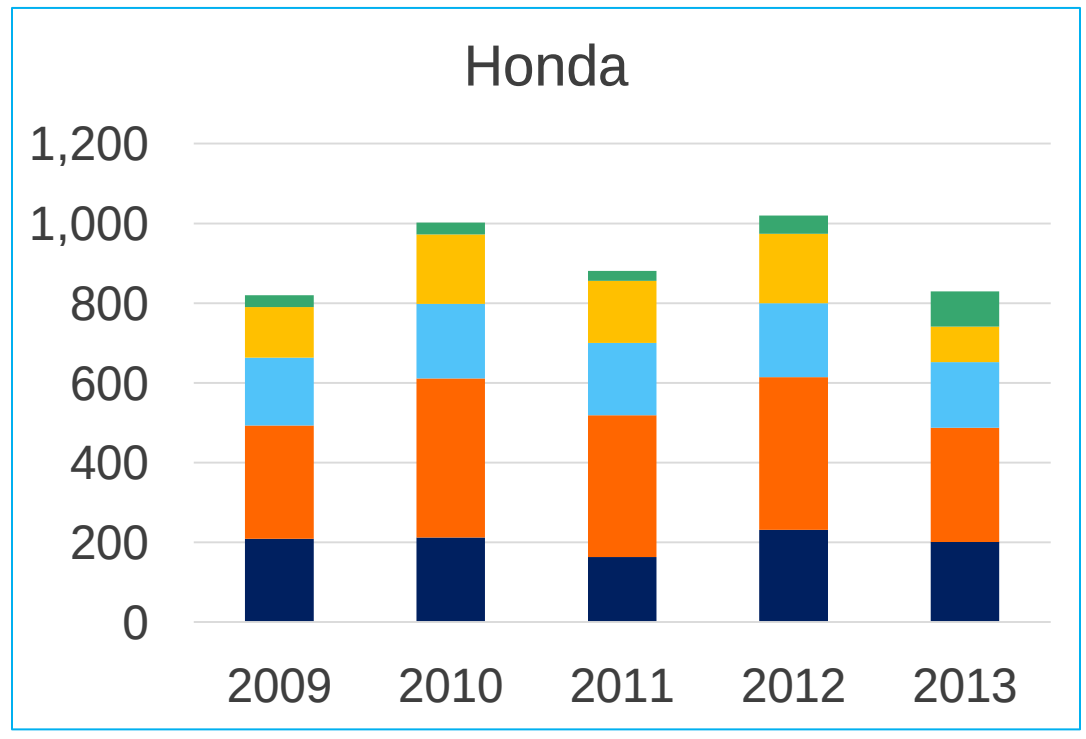
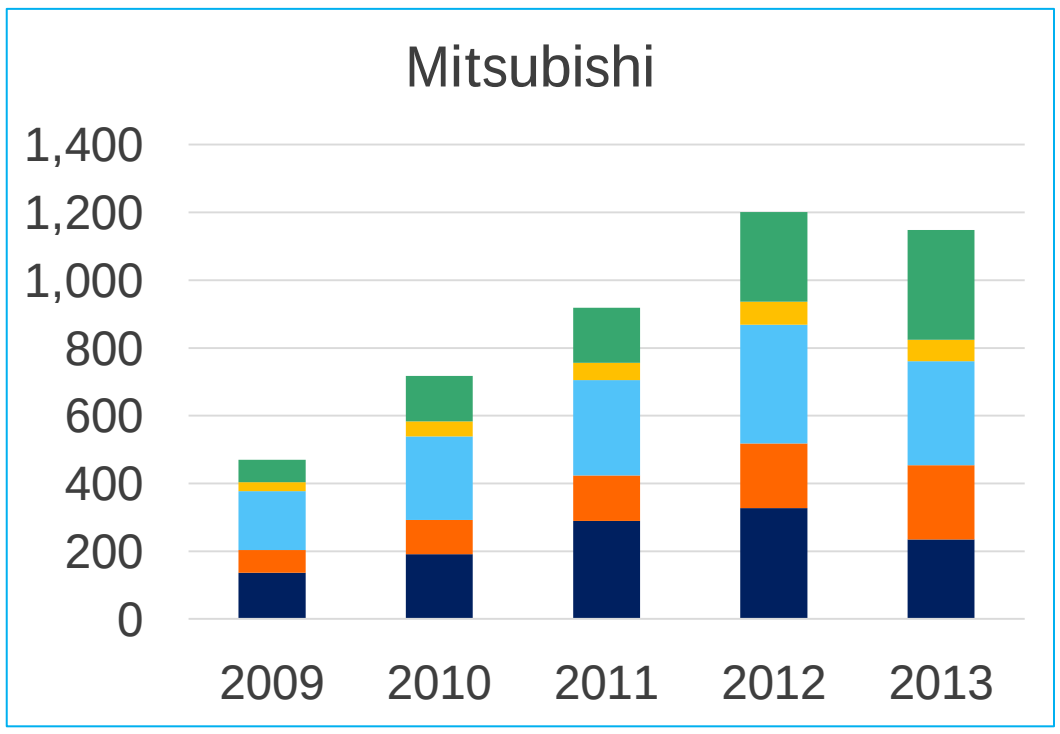
Top 5 Worldwide Cleantech Innovators in Recent Years

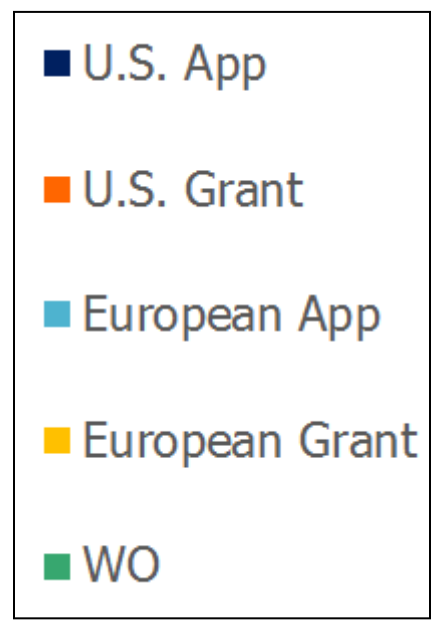












PATENT DATA DERIVED FROM CLEANTECH PATENTEDGE DATABASE.

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U.S. Patent Documents by Cleantech Industry Sector

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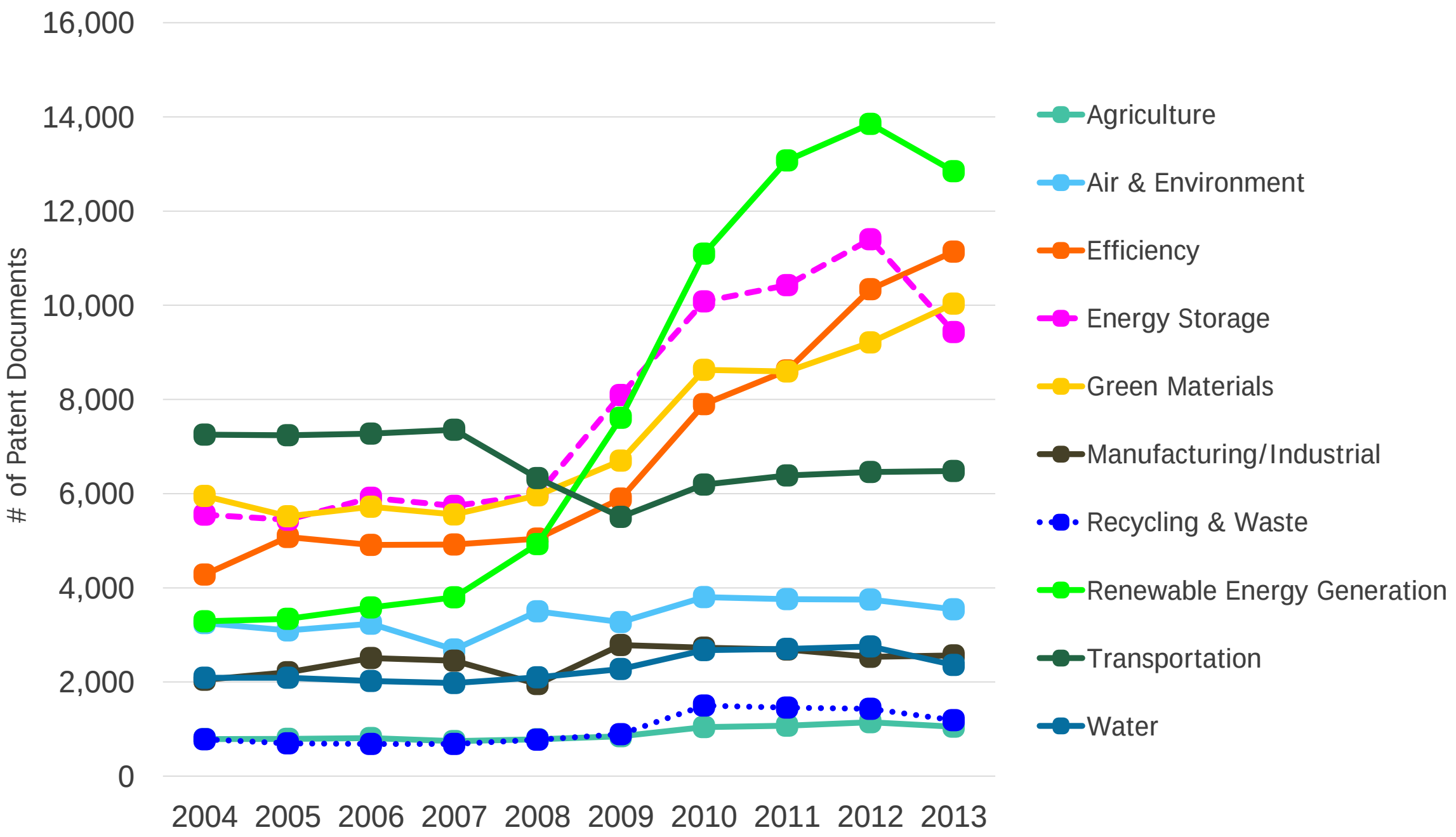
U.S. Cleantech Patent Activity: 2004-2013



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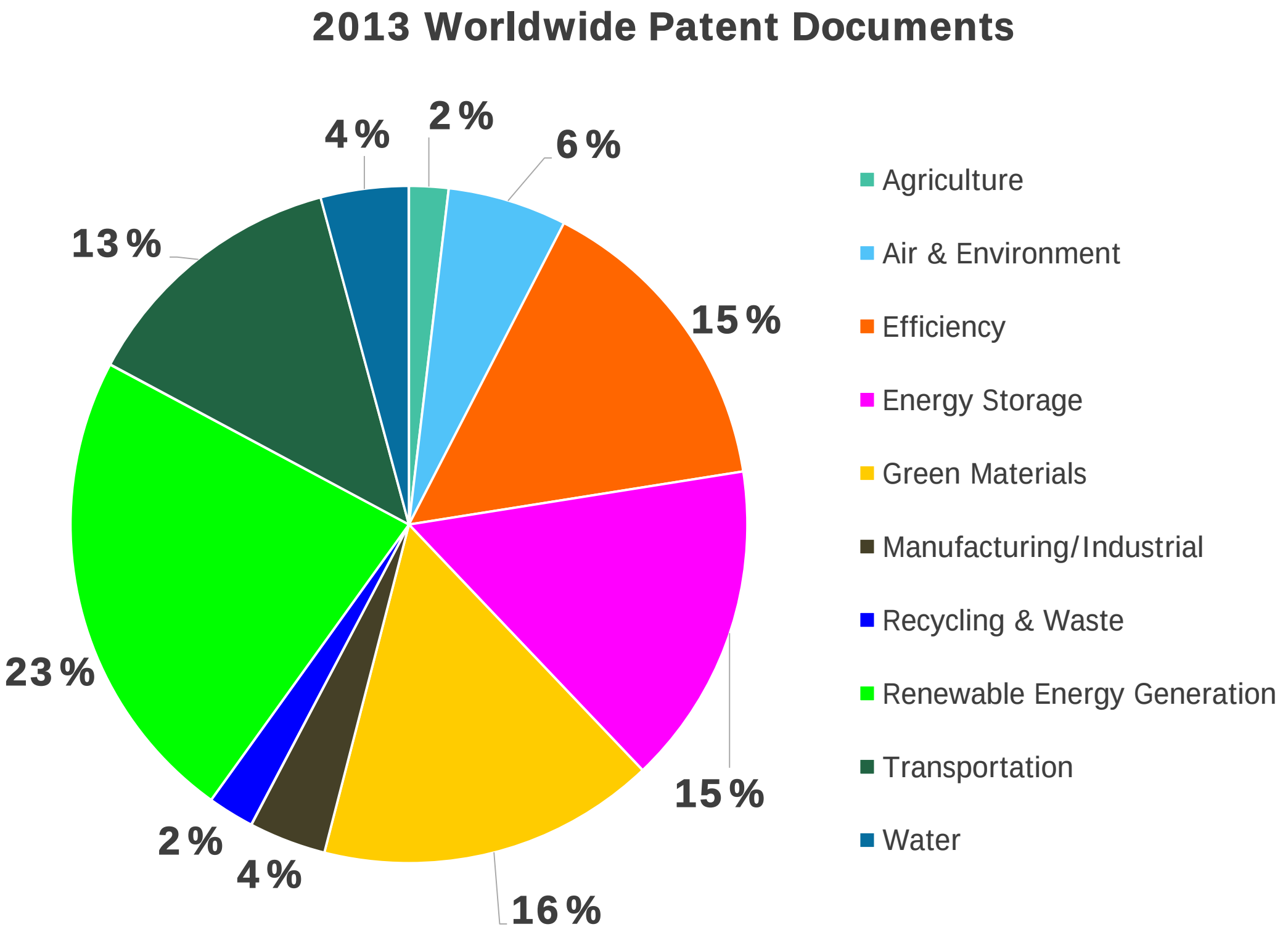
2013 Worldwide Cleantech Patent Activity by Industry Sector

HOT Sectors in 2013:

1. Renewable Energy
2. Green Materials
3. Energy Storage
3. Efficiency



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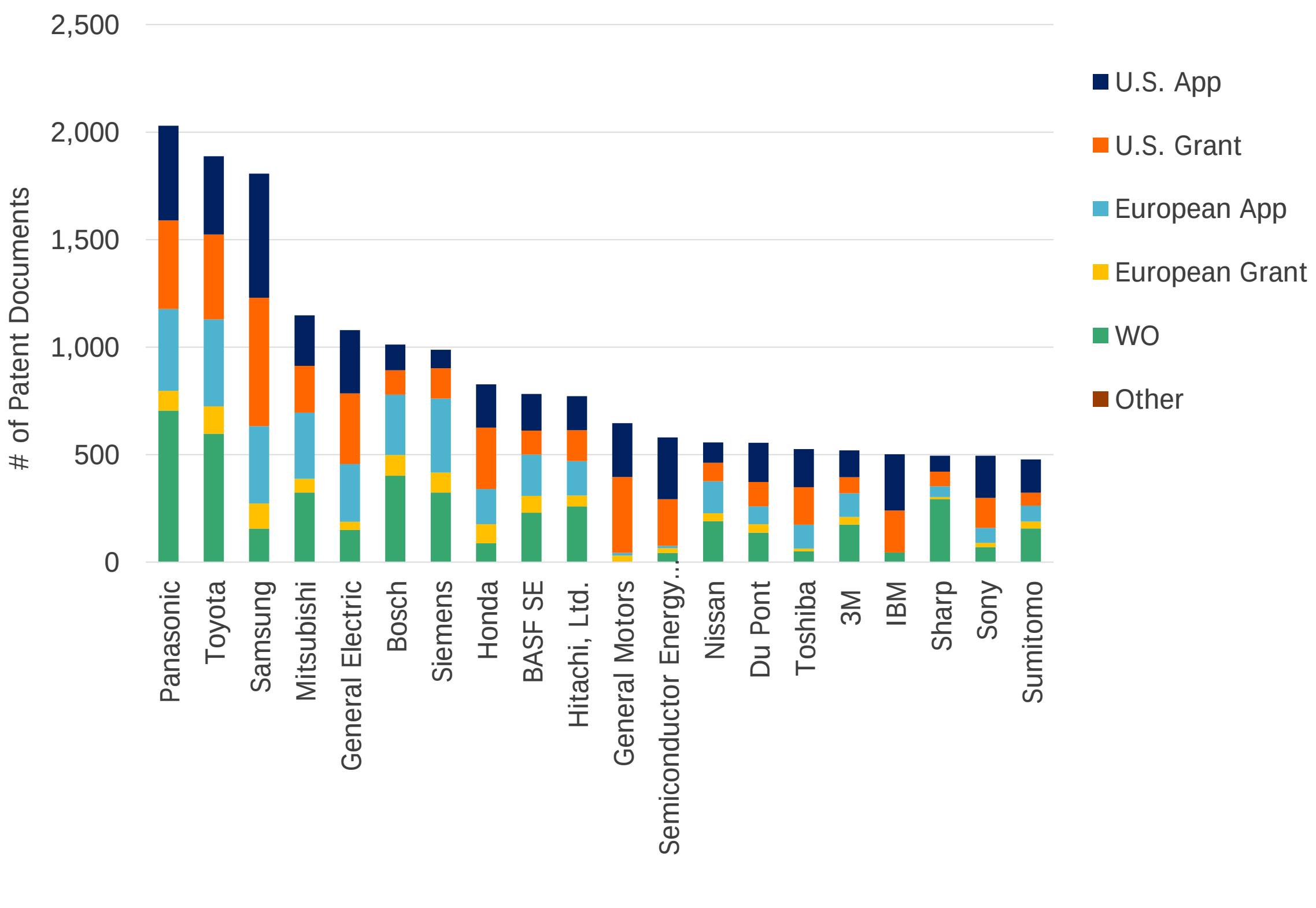
2013 Worldwide Patent Activity: Top 20 Cleantech Innovators

- Over 50% of the top 20 cleantech assignees operate in the consumer electronics industry.
- 20% of the top 20 cleantech assignees are auto manufacturers with various business divisions and a strong position in cleantech (likely from clean air initiatives).
- Toyota jumped from 4th place in 2012 to 2nd place in 2013.
- Top cleantech assignees largely operate in three industries: electronics, automotive, and general materials.



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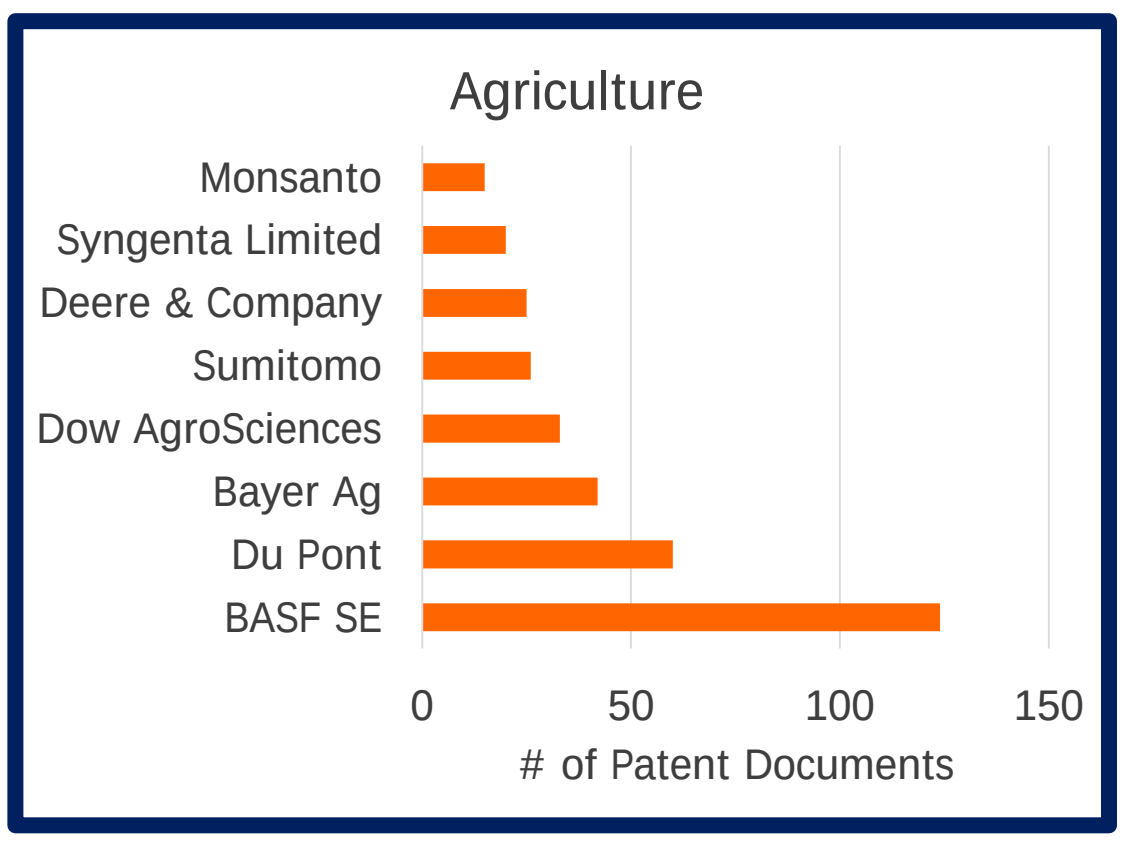
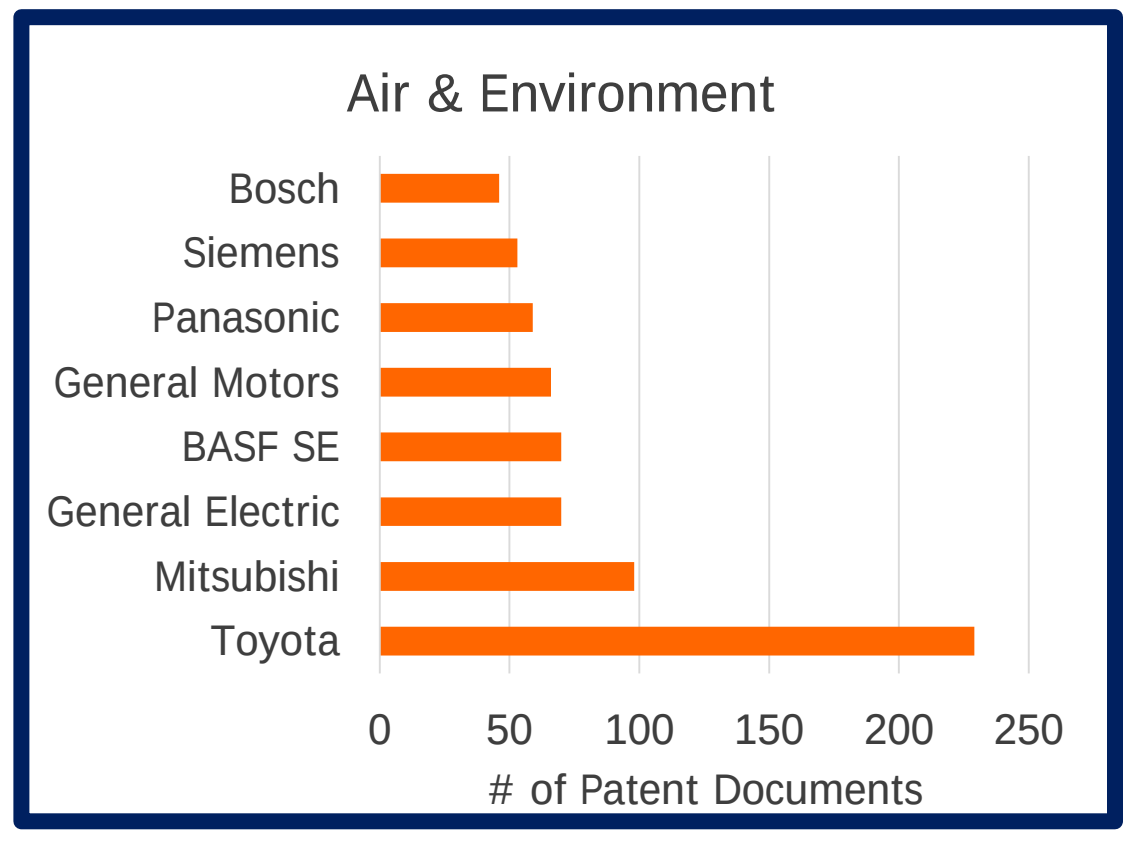
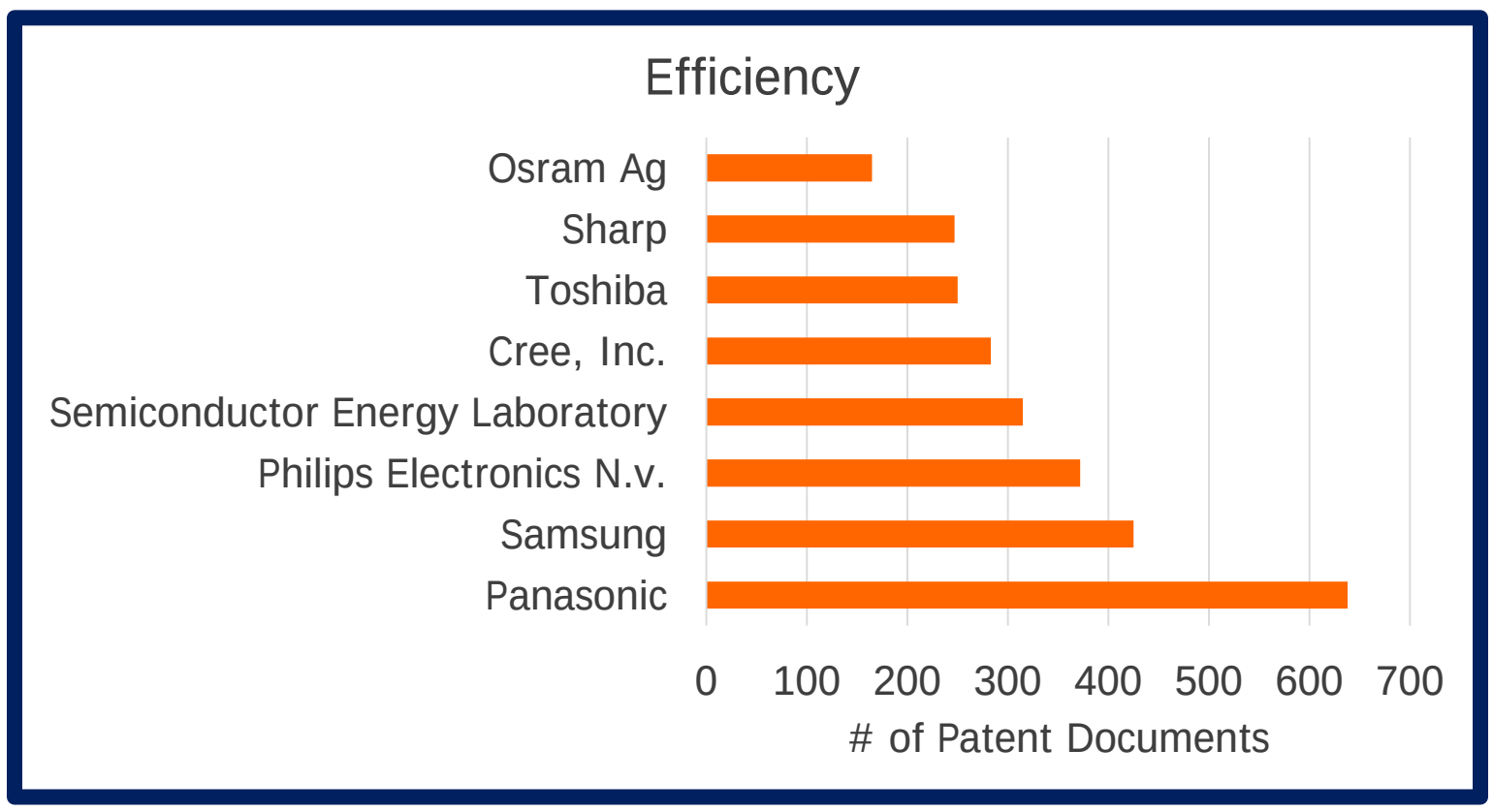
2013 | Top Worldwide Assignees in Selected Industry Sectors







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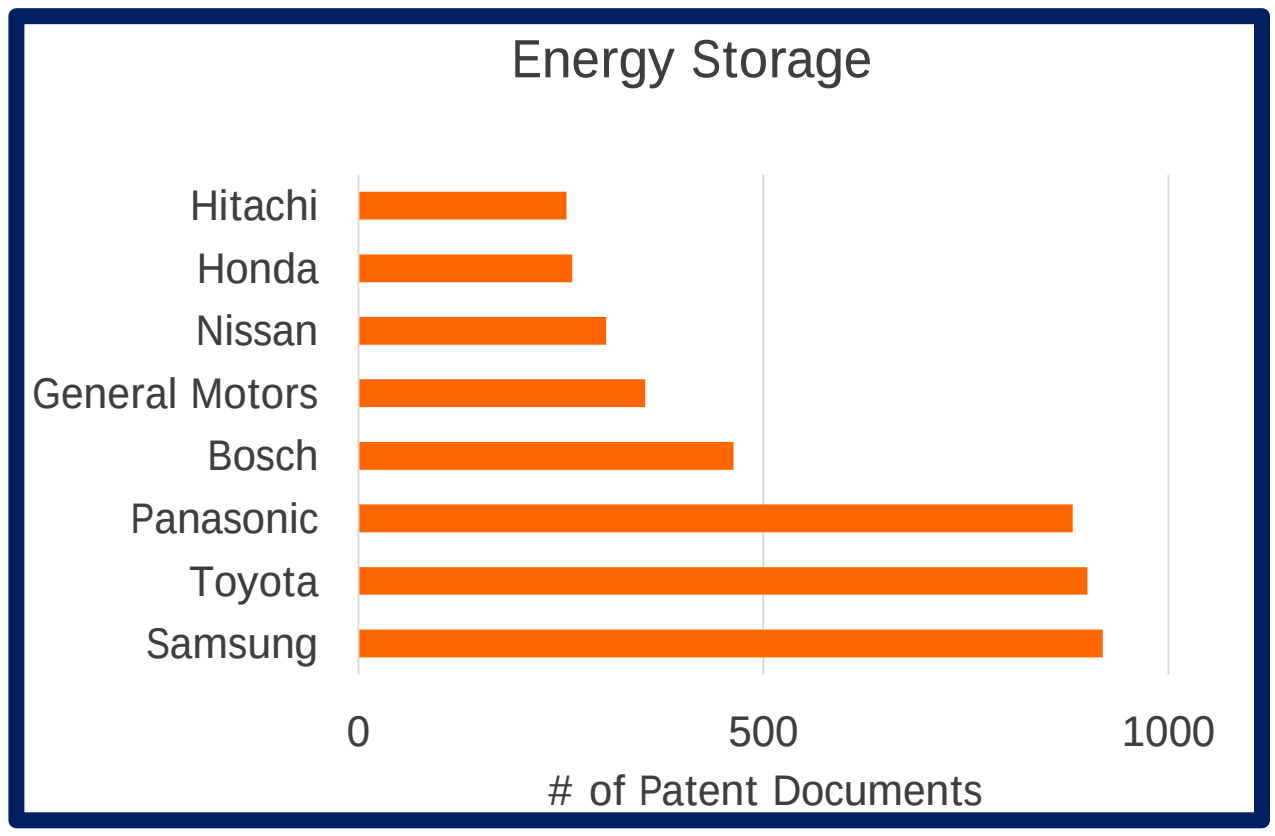
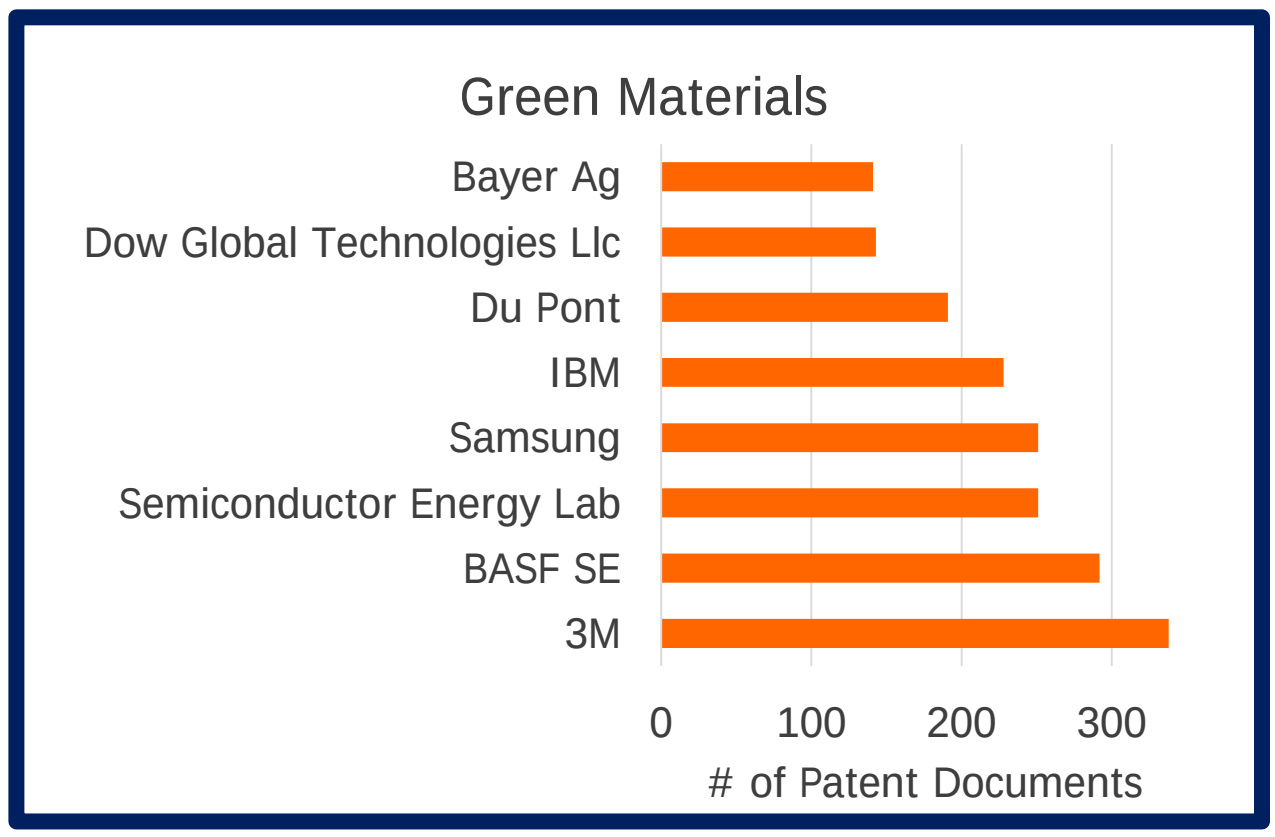
2013 | Top Worldwide Assignees in Selected Industry Sectors





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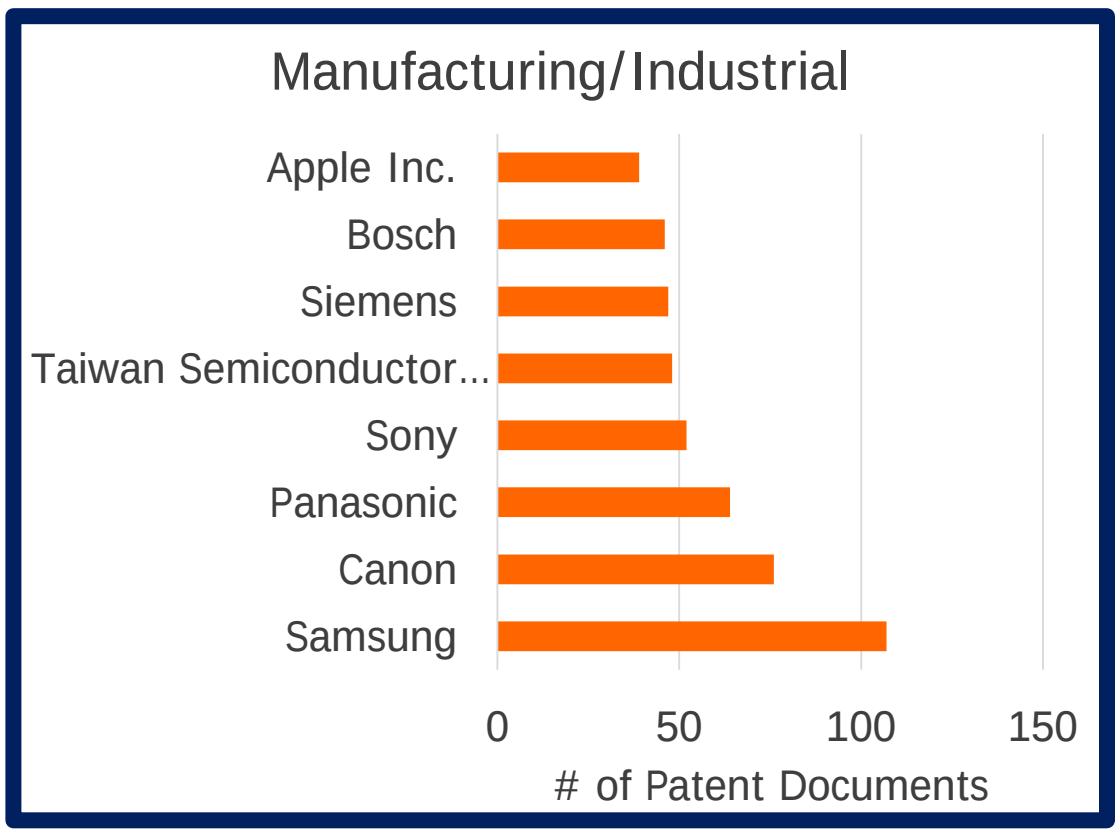

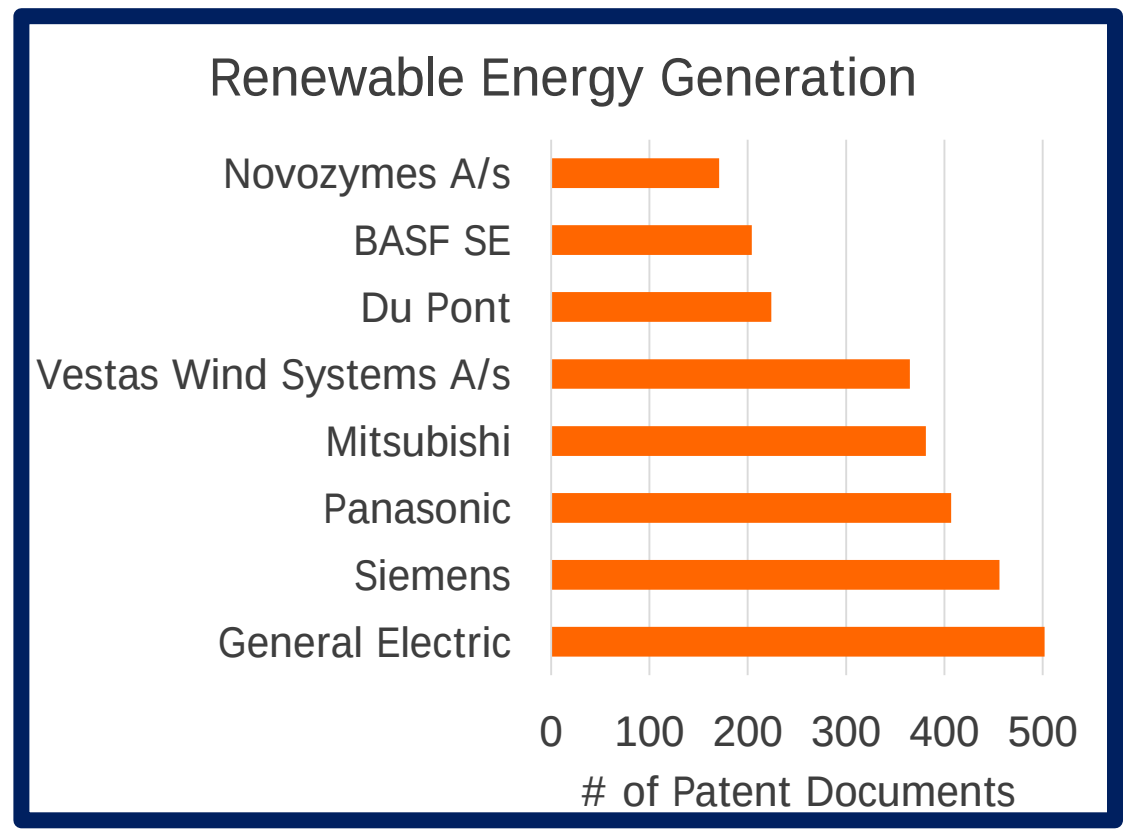

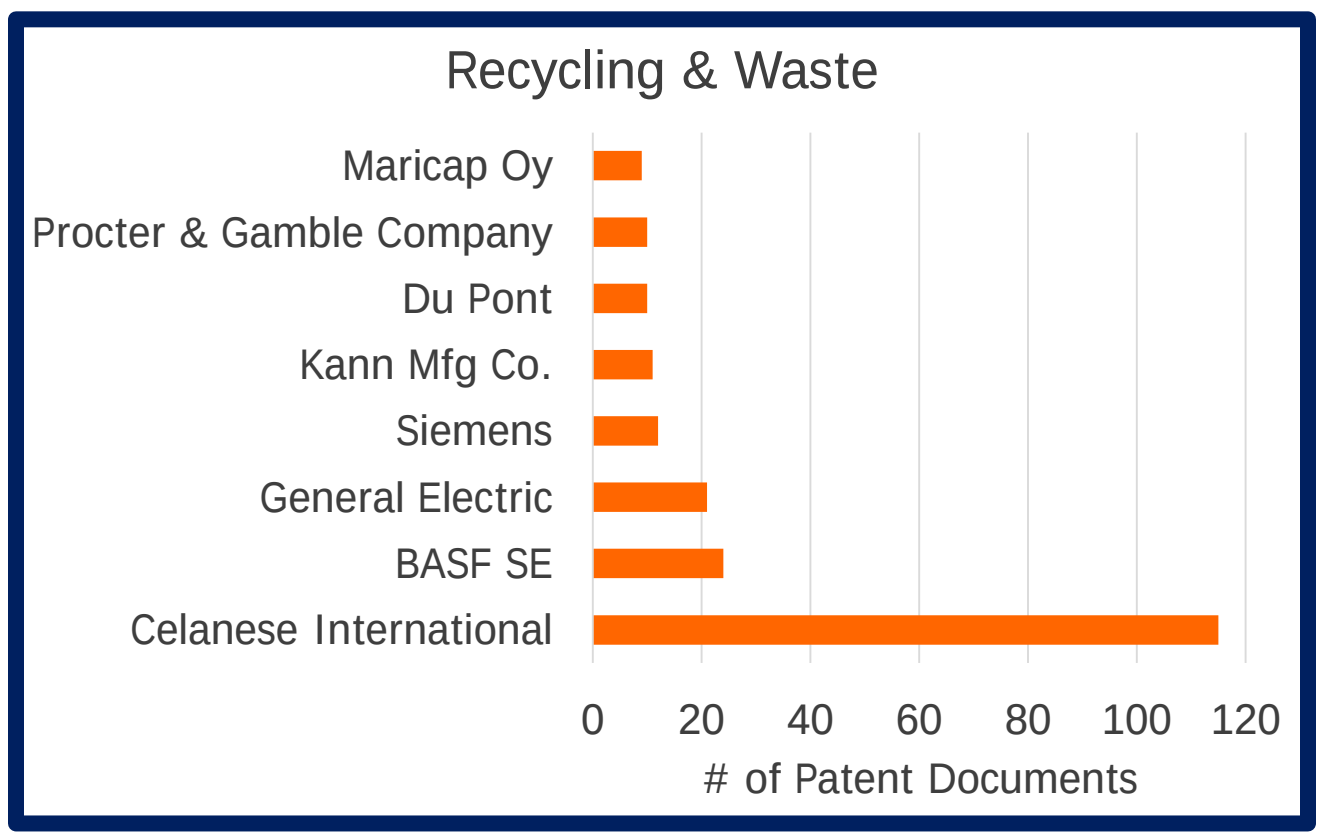

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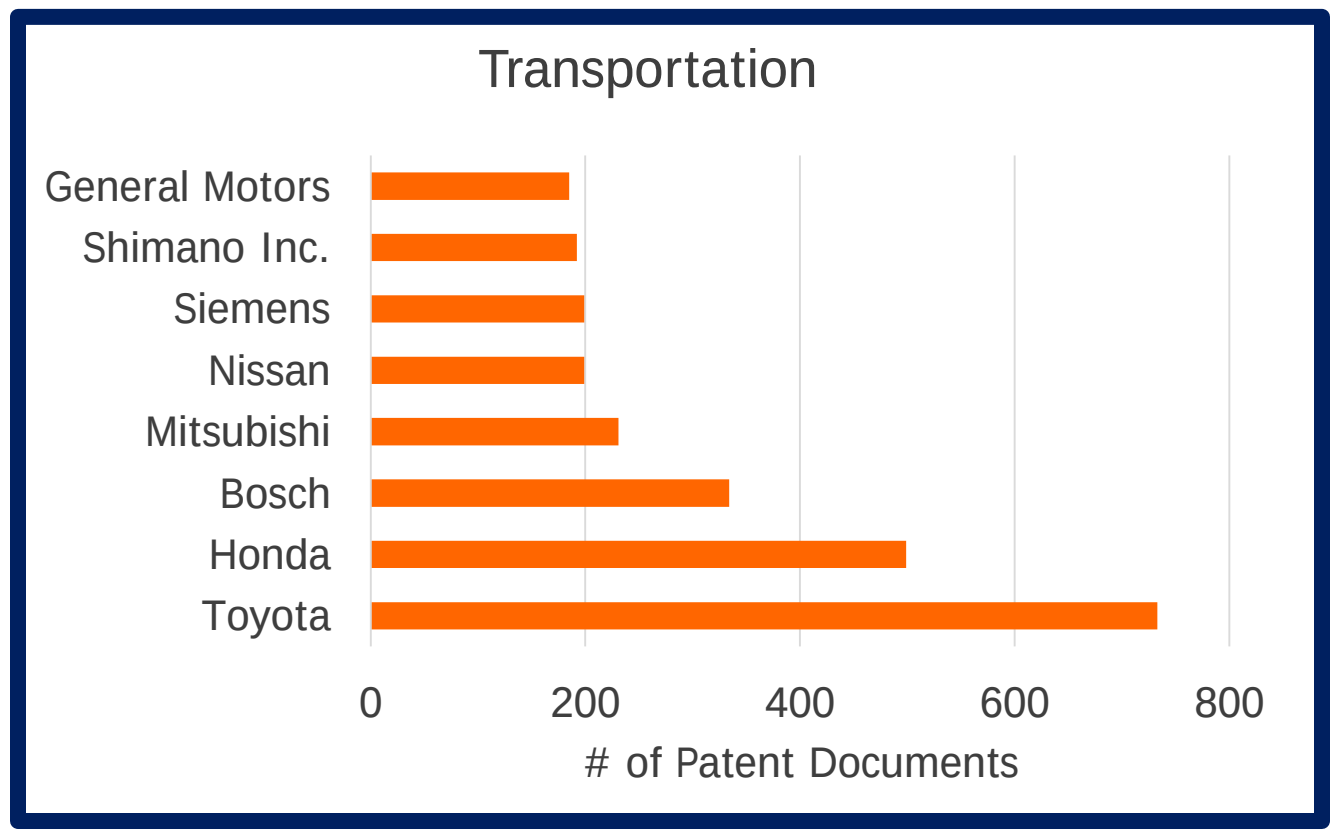

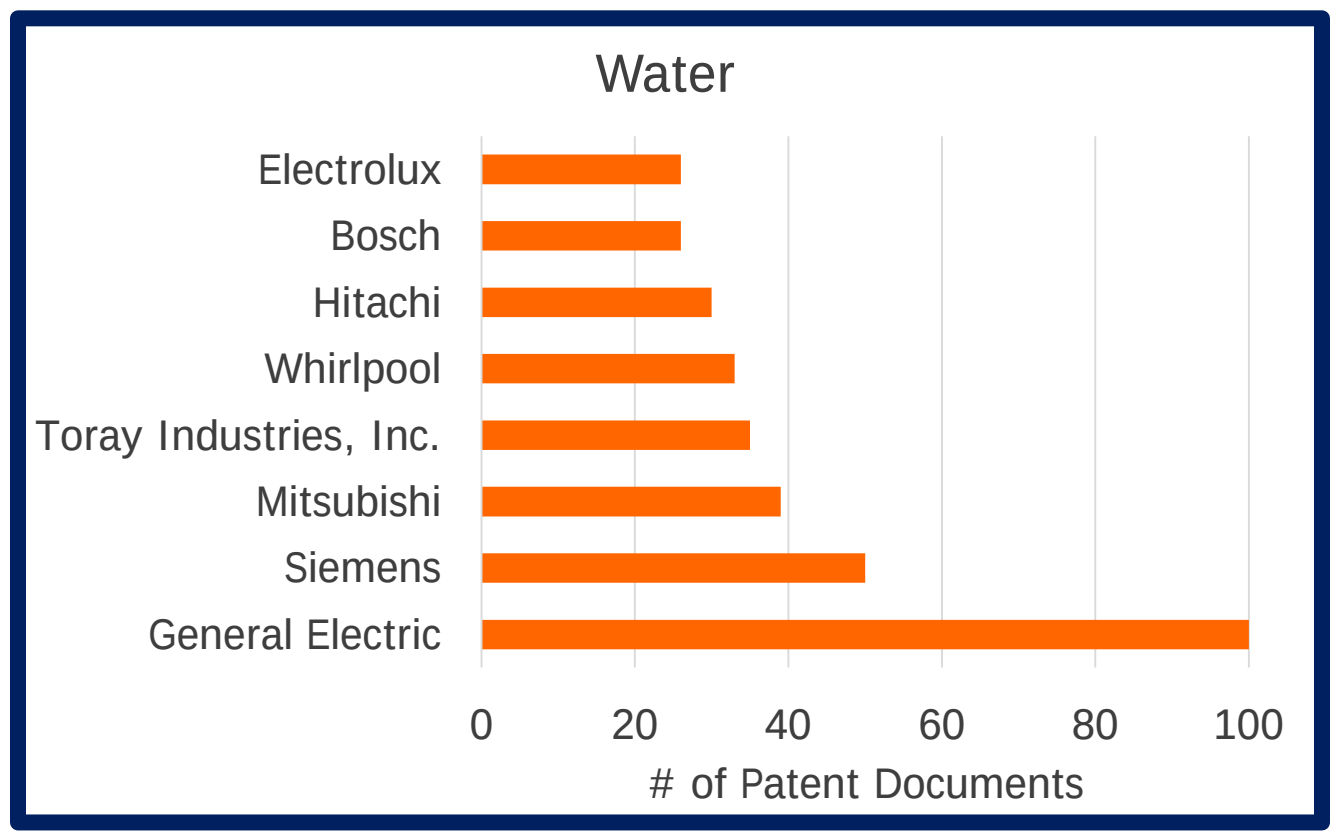

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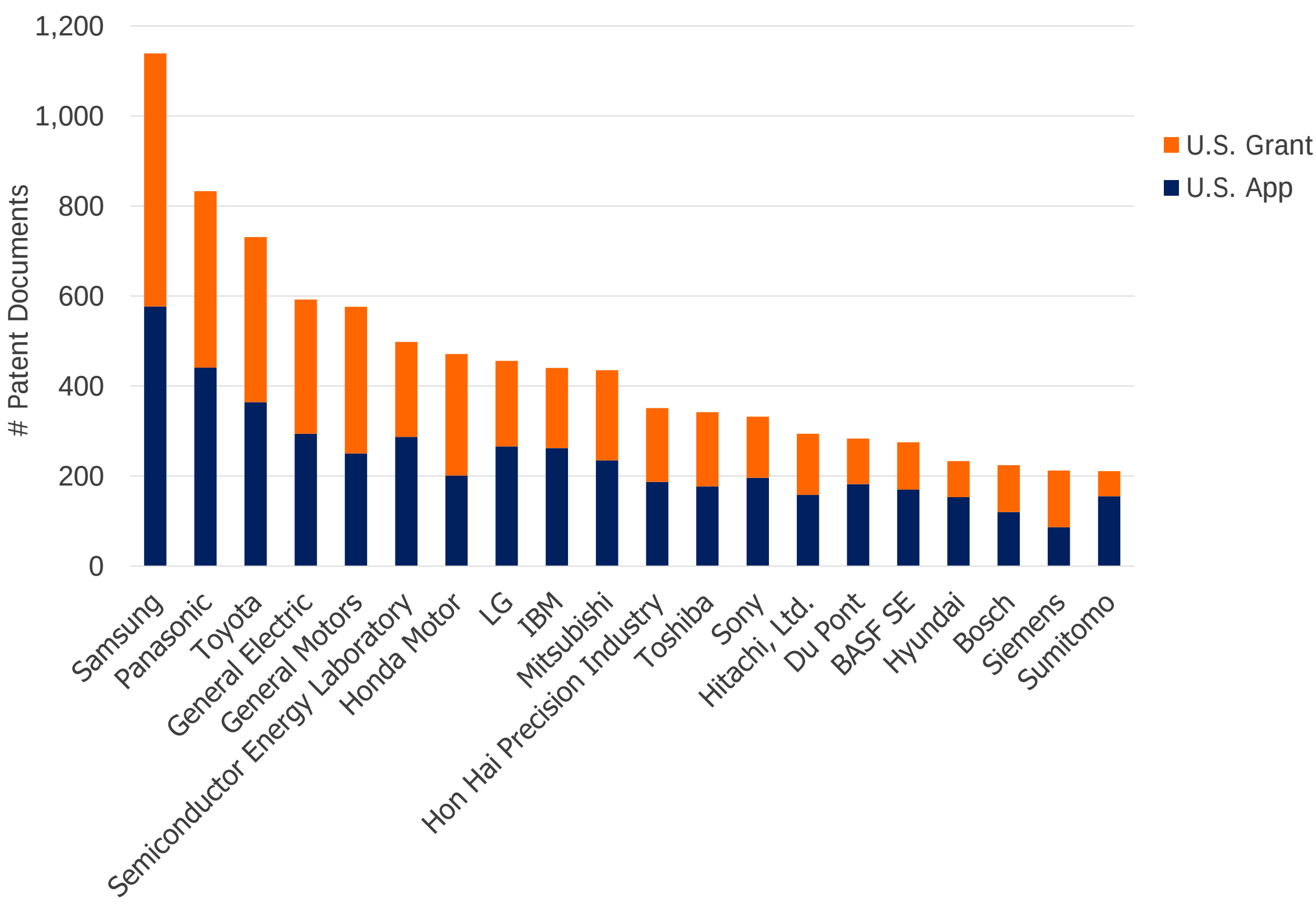
2013 U.S. Patent Activity: Top 20 Cleantech Innovators

Asian companies continue to dominate the cleantech landscape, comprising 60% of the Top 20 cleantech assignees filing patents in the U.S.



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Renewable Energy

THE LEADING CLEANTECH SECTOR

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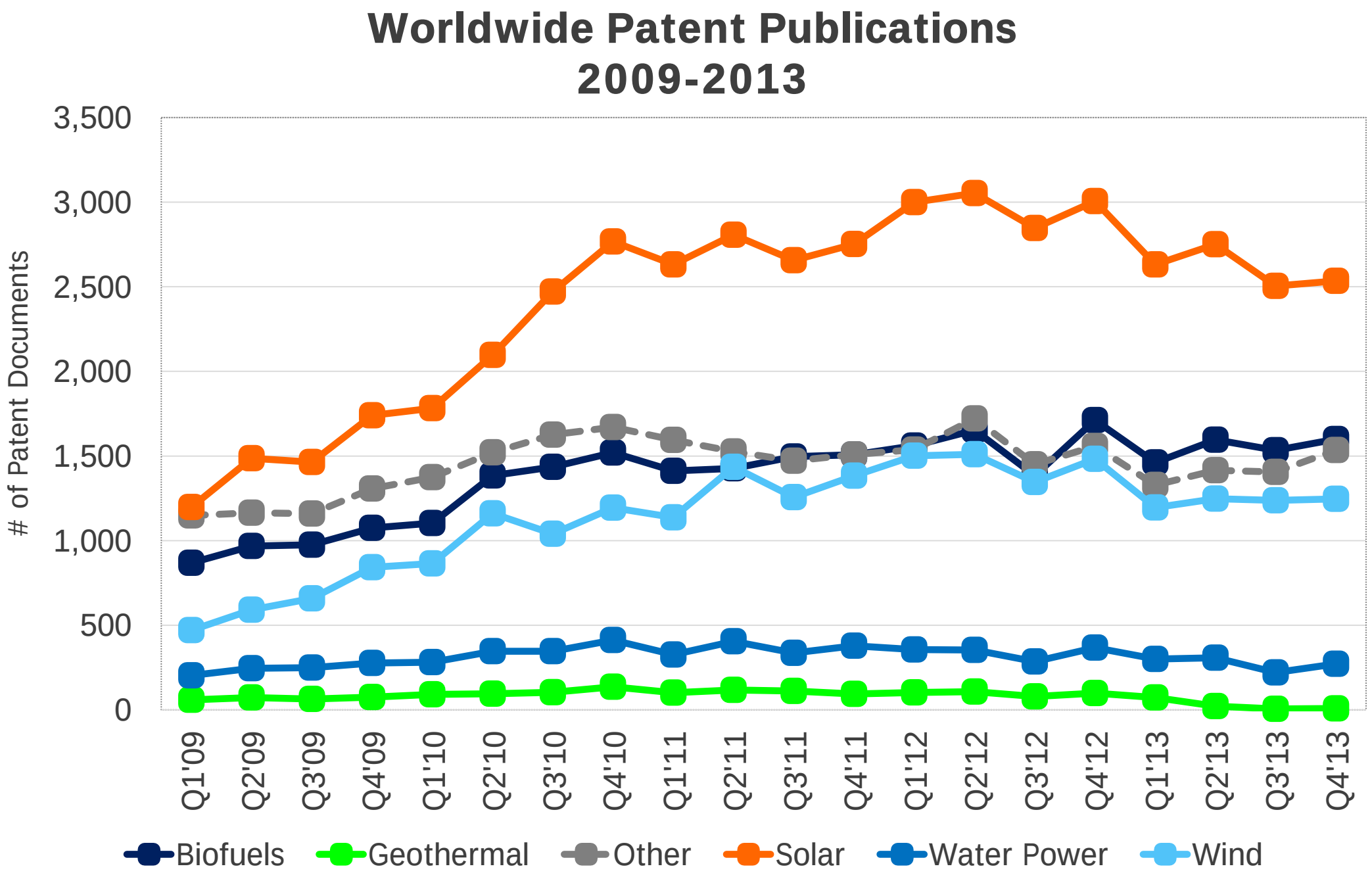
A Closer Look: Worldwide Renewable Energy Generation Patenting



- Most sectors within Renewable Energy Generation peaked in Q1 2012, and have since plateaued
- Solar and Biofuels are the most actively-patented areas in the Renewable Energy sector
- Patent activity in Biofuels has been growing steadily since 2009

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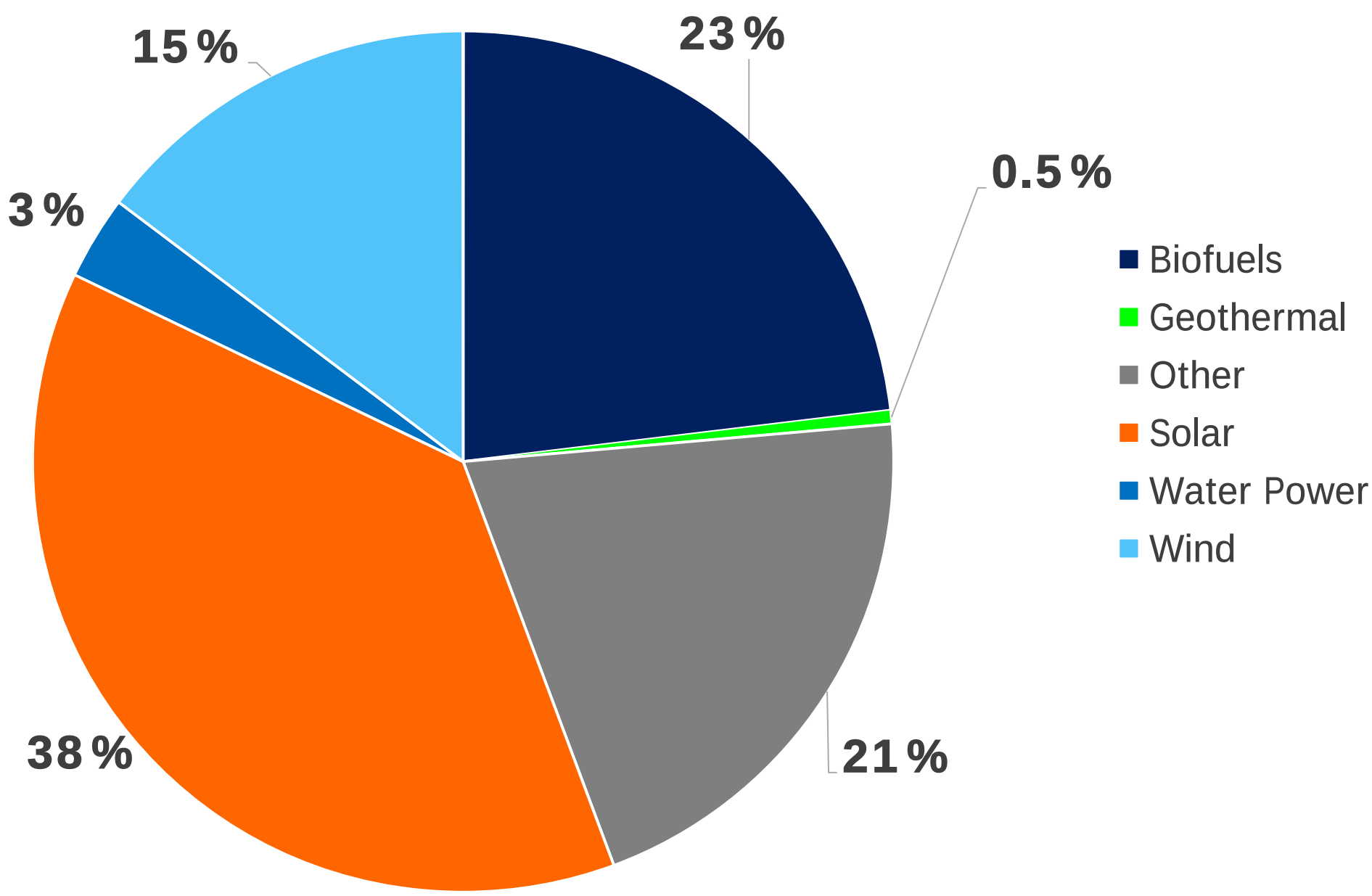
U.S. Renewable Energy Patenting

In 2013, most U.S. renewable energy generation patents were concentrated in the **solar**, **biofuels**, and "**other**" industry sectors. The "other" industry sector contains technologies relevant to areas such as **cogeneration, hydrogen production, and natural gas**.

2013 Renewable Energy Generation: U.S. Published Applications



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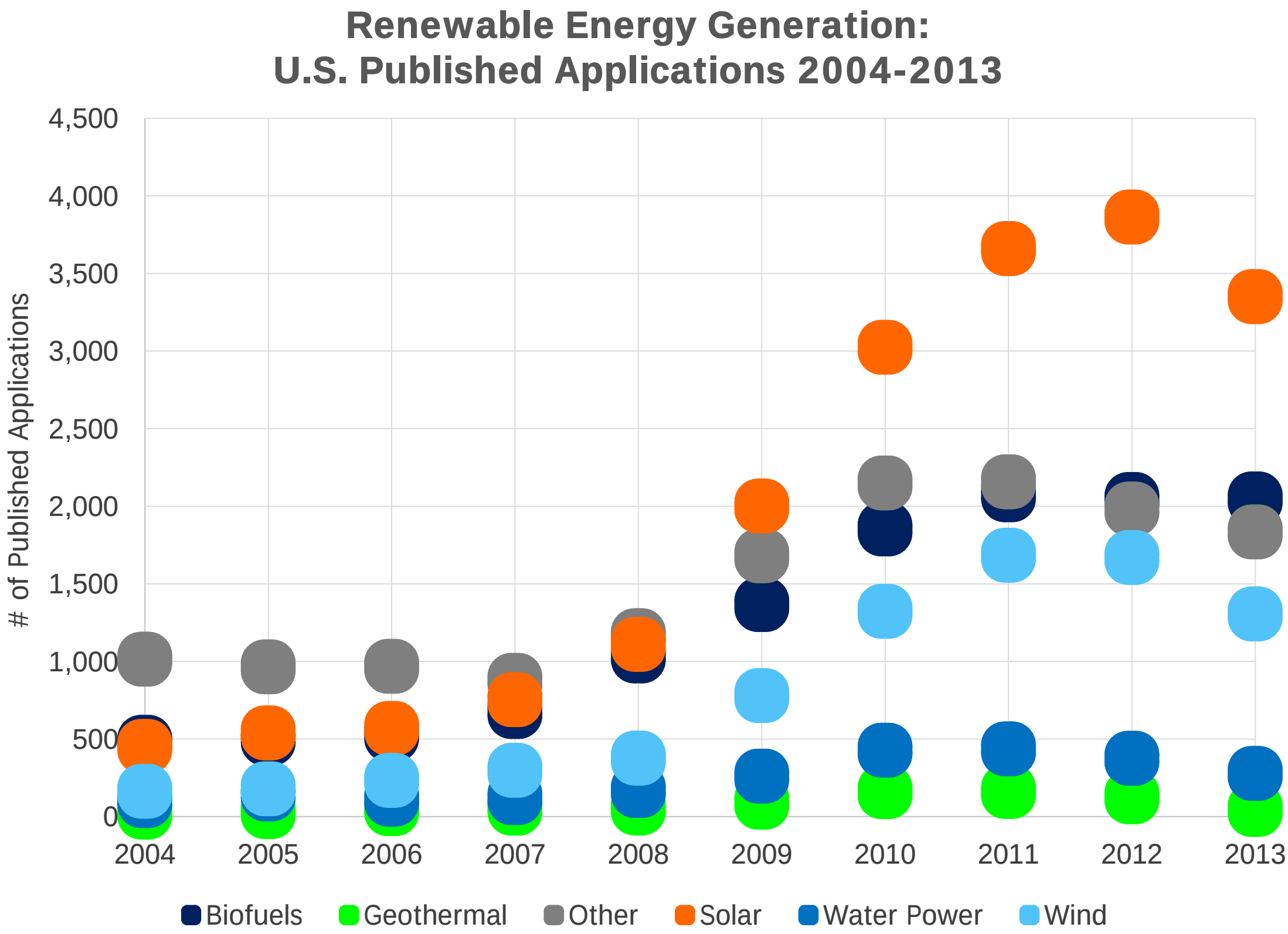
U.S. Innovation in Renewable Energy



- Over the past 10 years, patenting activity in the U.S. renewable energy sector has been dominated by solar-related technologies.
- Patenting activity in the biofuels sector appears to be on the rise, while sharp declines were observed in the solar and wind sectors in 2013.

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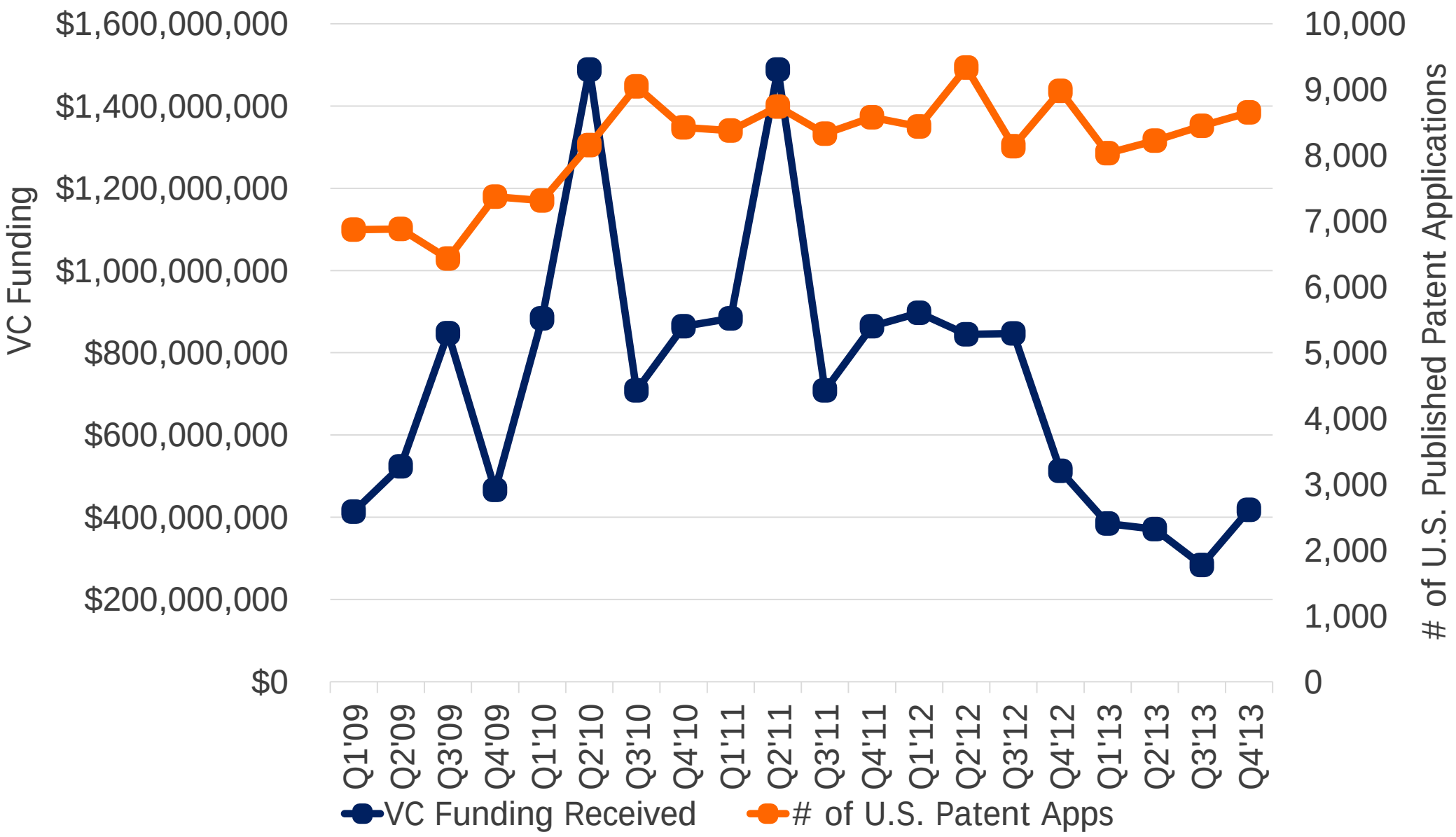
Cleantech Funding

SUPPORT FROM VENTURE CAPITAL DIMINISHES

Cleantech Venture Capital Funding Trends

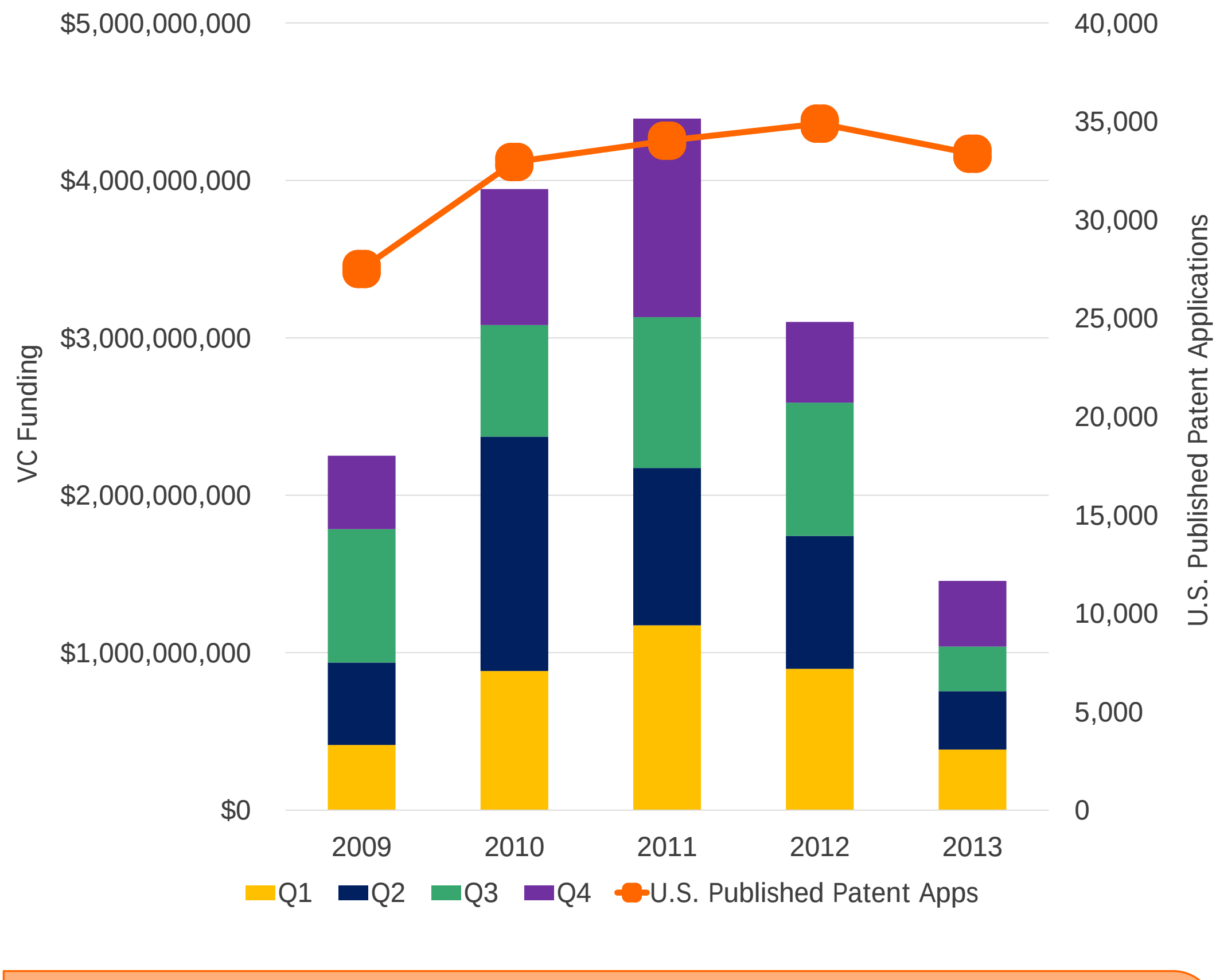
- Of the $29.4 billion in venture capital invested in 2013, 4.8% ($1.4 billion) was devoted to cleantech
- Funding from VCs has been volatile and has been decreasing significantly since Q3 2012, whereas patenting activity has remained relatively consistent since 2010
- PWC reported that, in 2013, VCs focused investments towards companies in the smart grid & energy storage and the water & waste management industries
- Correlation Coefficient: +0.17

VC Funding + U.S. Published Patent Applications: 2009-2013



CACHERE, CLARE. “PWC/NATIONAL VENTURE CAPITAL ASSOCIATION MONEYTREE REPORT Q1 1995-Q4 2013” PRICEWATERHOUSECOOPERS/NATIONAL VENTURE CAPITAL ASSOCIATION/THOMSON REUTERS. 17 JAN. 2014. WEB. 20 JAN. 2014.

VC Funding & U.S. Published Patent Applications: 2009 -2013



- In 2013, Venture Capital funding plunged by 53% YOY, but quarterly funding was proportionate to that seen in previous years.
- Although VC funding in cleantech has decreased substantially over the last two years, so far it does not appear to have had a significant effect on patent filing activity, at least in the U.S.

CACHERE, CLARE. "PWC/NATIONAL VENTURE CAPITAL ASSOCIATION MONEYTREE REPORT Q1 1995-Q4 2013" PRICEWATERHOUSECOOPERS/NATIONAL VENTURE CAPITAL ASSOCIATION/THOMSON REUTERS. 17 JAN. 2014. WEB. 20 JAN. 2014.

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Data for this report was provided by IP Checkups' CleanTech PatentEdge, an online compendium of Cleantech patent data presorted into over 150 green industry categories.

The database captures patent data from markets as diverse as advanced batteries, solar or wind energy, and water treatment processes.

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