

Investing in the global green economy: busting common myths

Defining and measuring the
investment opportunity



**FTSE
Russell**

Contents

3	Executive summary
4	Green economy features
5	Size and growth of the green economy
8	Diversification by size, sector and geography
13	Investment performance of green companies
14	Conclusion

Executive summary

Until now the transition to a sustainable and “green” economy¹ has been a loose concept rather than a defined, investable, industrial system. This lack of definition and data has led to the impression that it is of limited size; small cap dominated; lacking diversification and that investors give up performance in exchange for environmental benefits. However, analysis by FTSE Russell dispels these stereotypes. It finds a large investment opportunity, backed by global efforts to combat climate change and broader environmental challenges. The opportunity is diversified across company size, geography and sector and has delivered outperformance of the global equity market.

Key features of the green economy

Based on FTSE Russell’s calculations:

It’s substantial: The green economy represents 6% of the market capitalization of global listed companies, approximately US\$4 trillion. This represents a significant investment opportunity, approximately the same size as the fossil fuel sector.

It’s growing: The green economy proportion of the global market capitalization is growing, while the fossil fuel sector shrinks.

It’s diversified: The green economy is diversified by company size. While small and mid cap companies have a greater green exposure and represent a larger number of green companies the market is by no means small and mid cap dominated; large cap companies represent approximately two thirds of green market capitalization.

It’s multifaceted: The green economy is diversified across ICB² Sectors. Industrials are the largest element, followed by Utilities, Technology, Chemicals, and Construction and Materials. This highlights the diverse nature of goods and services addressing environmental challenges.

It’s global: The US is the largest element of the green economy; however Japan and Europe have the highest green exposure. While China is the third largest element of the green economy; its green exposure is underweight but growing rapidly.

It’s outperforming: Green companies have shown outperformance with FTSE Russell’s broadest green indexes outperforming their parent benchmarks over the last five years.³

¹ Note that in this paper we are treating the global public equity universe as a proxy for an economy wide assessment. As such our definition of the “green economy” is global listed equity market capitalization weighted by the green revenues as a proportion of total revenues rather than a macroeconomic assessment of global GDP.

² Industry Classification Benchmark (ICB) is a globally recognized standard, operated and managed by FTSE Russell, for categorizing companies and securities across four levels of classification: 10 industries, partitioned into 19 supersectors, which are further divided into 41 sectors, which then contain 114 subsectors. <http://www.ftserussell.com/financial-data/industry-classification-benchmark-icb>

³ See Figure 13, indexes outperforming over five years to March 2018.

Green economy features



Based on FTSE Russell's calculations

Size and growth of the green economy

There has been extensive discussion of the emergence of a new, green economy based upon clean technologies and green infrastructure.

It is estimated by the Global Commission on the Economy and Climate, co-chaired by Lord Nicholas Stern, that US\$90 trillion of investment is needed by 2030 to avert more than 2 degrees of global warming since pre-industrial levels.⁴ This huge capital deployment provides significant opportunities for the companies involved and for investors who align their portfolios. However, given the cross cutting nature of the opportunity, it does not always fit with investors traditional view of sectors and geographies and the stereotype is that it is a minor opportunity focused on volatile, small cap stocks.

One of the challenges of addressing the green investment opportunity has been a lack of definition and data. Beyond high level, and in many cases differing, views of what might be considered green/environmental activities or a small number of focused renewable energy companies there is limited consistent, global coverage of the sector. There is no consistent taxonomy of green products and services and it is not typically disclosed with any specificity by companies. As such defining and creating a coherent investment strategy, be it passive or active, is challenging compared with the equivalent for a traditional industry sector or geography.

FTSE Russell has taken a broad view of the green economy aiming to capture products and services in renewable and alternative energy, energy efficiency, water, and waste and pollution. They are analyzed based on their impact on climate change mitigation and adaptation, water, resource use, pollution, and agricultural efficiency. Individual, listed companies are analyzed based on their exposure to these sectors, with a score based on the percentage of their revenues derived from these products and services.⁵ These scores are then aggregated up; weighted by the company's investable market capitalization to generate an overall exposure at country/sector level and ultimately an overall, global exposure estimate.

"Significant investment is needed over the next 15 years: around US\$90 trillion, which is more than the entire current [infrastructure] stock."

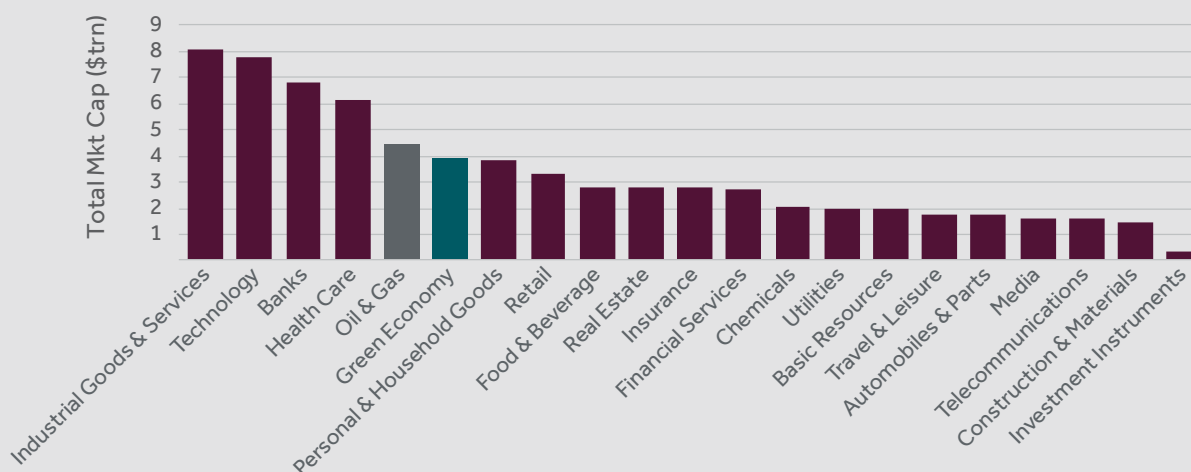
The Sustainable Infrastructure Imperative Report⁴
Global Commission on the Economy and Climate

⁴ The Sustainable Infrastructure Imperative: Financing for Better Growth and Development, Global Commission on the Economy and Climate, October 2016.

⁵ See FTSE Green Revenues. <http://www.ftserussell.com/index-series/index-spotlights/green-revenues>

Overall we calculate that approximately 6% of the global listed equity market is derived from the green economy.⁶ This is a significant investment opportunity representing almost US\$4 trillion in market capitalization.⁷ The green economy is similar in size to the ICB Oil and Gas Supersector, to which it is often compared.

Figure 1. ICB Supersectors plus green economy ranked by market capitalization



Source: FTSE Russell as at December 2017.

There are approximately 3,000 global, listed companies with exposure to the green economy. This number has risen by approximately 20% since 2009 and covers 30% of global, listed market capitalization. The overall exposure of the green economy has also grown, particularly from 2013.

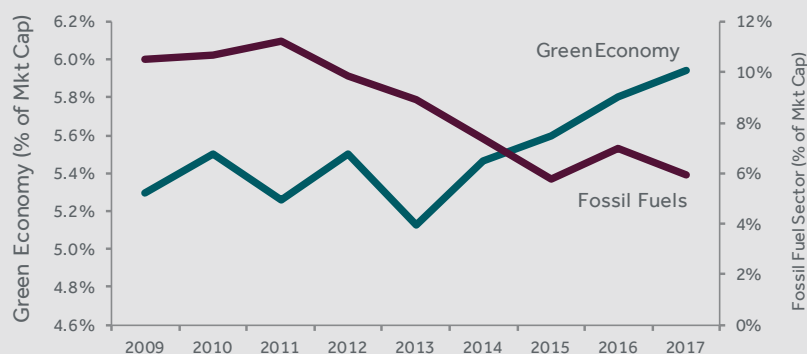
"There are approximately 3,000 global, listed companies with exposure to the green economy."

⁶ Sum of investable market capitalization of green revenue companies, weighted by their green revenues percentage divided by sum of all companies market capitalization.

⁷ Sum of investable market capitalization of green revenue companies, weighted by their green revenues percentage.

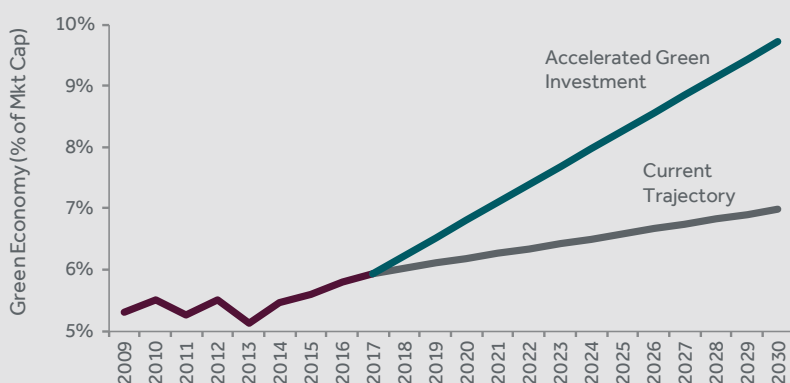
As a substantial and growing market sector, the green economy provides a significant opportunity for investors. It has grown as a proportion of the total market, while the fossil fuel sector has shrunk.⁸ If it continues its current trajectory it could represent 7% of global market capitalization by 2030. If green investment accelerates to ~\$90trillion level suggested it could reach ~10%, a similar size to global health care.

Figure 2. Growth of the green economy vs fossil fuel sector⁹



Source: FTSE Russell, data as of December 2017. Please see the end for important legal disclosures.

Figure 3. Potential future growth trajectory¹⁰



Source: FTSE Russell, data as of December 2017. Please see the end for important legal disclosures.

⁸ Percentage of market capitalization from ICB Oil & Gas Producers and Oil Equipment, Services & Distribution Sectors and Coal Mining Subsector.

⁹ Green economy size based on a proportion of the total investable market capitalization including FTSE Global Equity Index Series, China Large & Mid Cap A Shares, Russell 3000®, UK All Share & Japan All Cap Indexes.

¹⁰ Current Trajectory estimate based on extrapolation of growth based on average growth rate from 2009 to 2017. Accelerated Green Investment estimate based on assumed rate \$90tn of green infrastructure investment over 15 years generating an additional \$6tn green revenues in 2030. Assume one time price to sales ratio and 3% growth for the rest of the market.

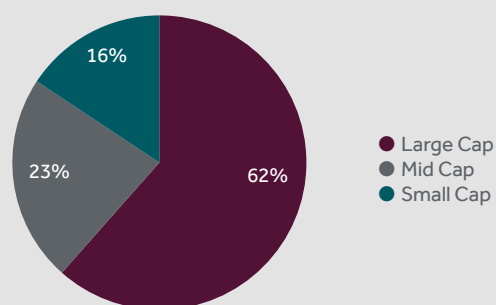
Diversification by size, sector and geography

Mixture of large, mid, and small caps

As the green economy has grown, large cap companies have become more involved. They have developed and consolidated the market, acquiring smaller, faster moving rivals. As such approximately two thirds of the green economy is now made up of large cap companies (by market capitalization).

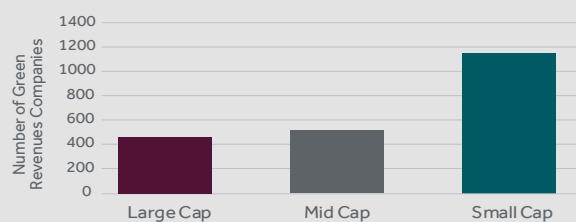
There is still a greater number of small and mid cap companies involved in the green economy and their focus on green revenues (as measured by their green revenues as a proportion of total revenues) is higher. Arguably they may be driving innovation in the green economy, even if two thirds of the size of the market comes from large companies.

Figure 4. Green economy by company size¹¹



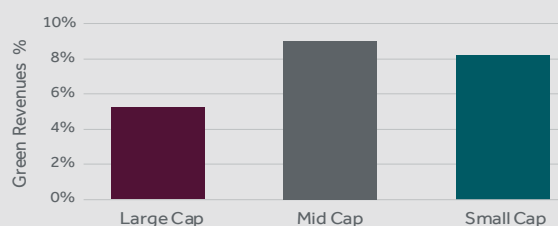
Source: FTSE Russell, data as of December 2017

Figure 5. Number of green companies by size



Source: FTSE Russell, data as of December 2017

Figure 6. Green exposure by company size



Source: FTSE Russell, data as of December 2017

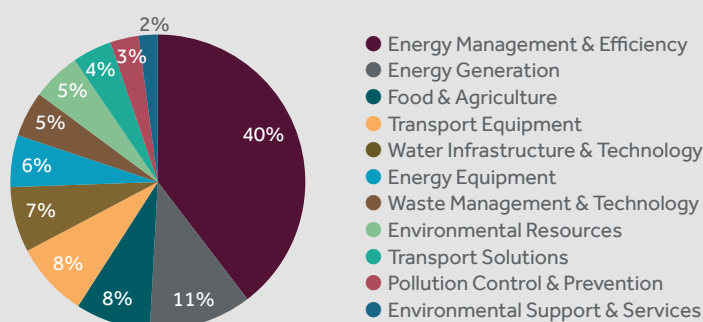
¹¹ Company size as defined by FTSE Russell in the FTSE Global Equity Index Series on a region relative basis.

Diverse range of green industries

The green economy is made up of a diverse range of products and services addressing multiple environmental challenges. The largest element is from energy efficiency, a very diverse segment ranging from building insulation to cloud technology.¹² These solutions can often have significant environmental benefits as well as being the most cost effective, as such it is unsurprising they are the largest segment of the green economy. Alternative energy covers both newer technologies, growing and diversifying rapidly, such as solar, and more established technologies, such as large hydroelectric. Resources are also a key area of the green economy, such as lithium for batteries, lightweight materials, organic foods or seeds developed to boost agricultural yields.

The largest companies in the green economy are a mix of both companies where the majority of their revenue is green, such as Tesla or Waste Management Inc, and large companies where a minority sub-segment is green, such as Microsoft or Siemens.

Figure 7. Green economy by green sector¹³



Source: FTSE Russell, data as of December 2017

Figure 8. Largest companies in the green economy¹⁴

Company	% of Market	Green activities
Microsoft	2.4	Cloud infrastructure & video conferencing
TSMC	2.4	High efficiency electronics
China Yangtze Power	1.4	Hydroelectric power generation
ABB	1.1	High efficiency power infrastructure & industrial automation
Amazon	1.1	Cloud infrastructure
Tesla	1.1	Electric vehicles
Monsanto	1.0	High yielding & drought resistant seeds
Waste Management	1.0	Waste management & recycling
Siemens	0.8	Renewable energy equipment, water treatment equipment, mobility solutions & high efficiency power infrastructure, industrial & building
NextEra Energy	0.7	Renewable & low carbon power generation
Honeywell	0.7	Automotive & building energy efficiency

Source: FTSE Russell, data as of December 2017

¹² Cloud computing technologies can reduce CO₂ emissions by up to 90%, Cloud Computing and Sustainability: The Environmental Benefits of Moving to the Cloud, Accenture, 2010.

¹³ Aggregated sectors, based on largest green sector per company.

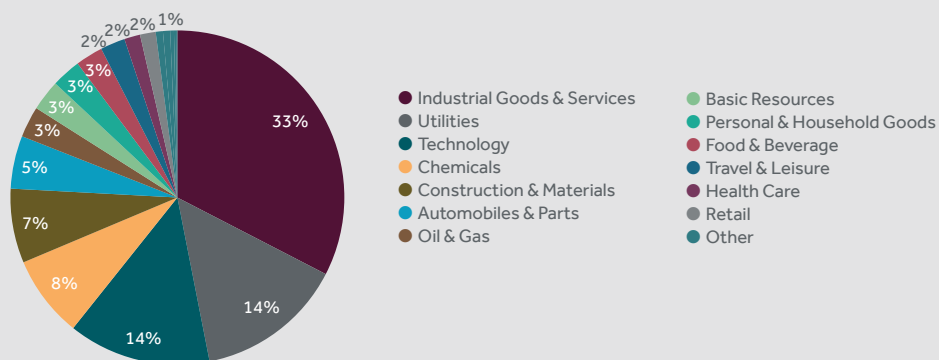
¹⁴ Largest companies by market capitalization weighted by green revenues as a proportion of total revenues. % of market in the table is the company's market capitalization weighted by green revenues as a proportion of total revenues divided by total market capitalization weighted by green revenues as a proportion of total revenues.

Diverse industry exposure

The green economy is represented across most of the traditional industry sectors as defined by ICB. It is diversified across both cyclical sectors, such as ICB Industrials, and defensive sectors, such as ICB Utilities. These are the two largest sectors in the green economy, representing US\$1.3 trillion and US\$0.6 trillion of market capitalization respectively, 47% of the total. These two ICB Sectors also have significantly higher percentage of green revenues than the market average. Technology, the third largest ICB Sector, has a lower green revenues focus, but given the development of innovative new green technologies it is a key growth area, in particular for Energy Efficiency. ICB Chemicals and ICB Construction and Materials represent a different type of opportunity to meet the new resource requirements for developing green infrastructure. There are also certain ICB Sectors which are, by nature of their activities, underweight in the green economy; in particular ICB Health Care, Telecommunications and Financials.

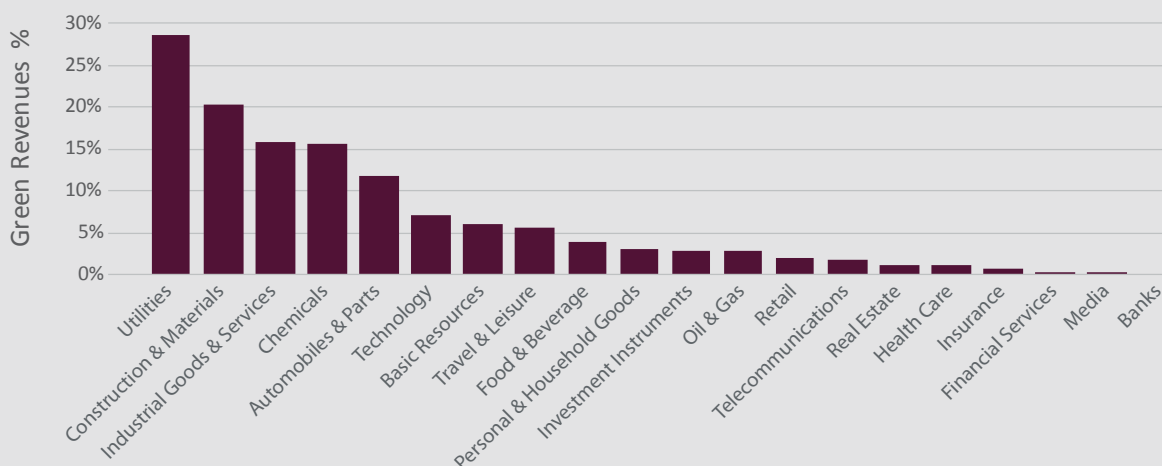
Overall the green economy is concentrated in certain traditional ICB Industrial Sectors, however within these it is exposed to a range of different types of companies allowing an investor to develop a diversified portfolio.

Figure 9. Green economy by ICB Supersector



Source: FTSE Russell, data as of December 2017

Figure 10. ICB Supersectors by green exposure



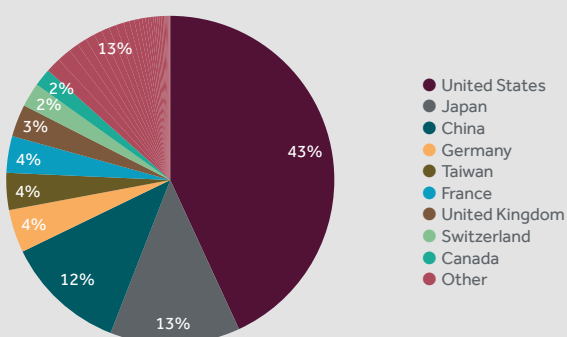
Source: FTSE Russell, data as of December 2017

Broad geographical coverage

Similar to the global market, the US is by far the largest exposure. However despite being a leader in areas such as cloud technology the US is slightly below the global average in terms of green revenues exposure. Japan has a large green revenues exposure, being a leader in areas such as electric rail, overweighting the country to second largest in the green economy. China is underweight as it has slightly lower green revenues exposure (although both the number of green companies and their exposure is growing rapidly and some of the green companies are unlisted). Europe is a significant part of the green economy and would be the second largest part as a group. Germany and France are particularly large, overweight and with higher than average green exposure.

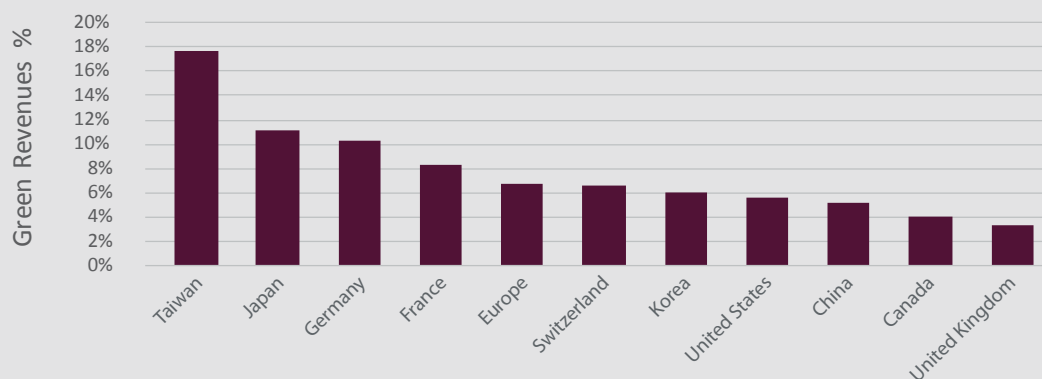
For the investor there are some variations of geographical exposure compared with the global market but enough breadth to create a globally diversified portfolio.

Figure 11. Green economy by country of domicile



Source: FTSE Russell as of December 2017

Figure 12. Average green exposure of companies by country of domicile¹⁵



Source: FTSE Russell as of December 2017

¹⁵ Top 10 countries of the green economy by green weighted market capitalization of the companies by country of domicile (plus Europe aggregate). Ordered by average green revenue as a proportion of total revenue.



Investment performance of green companies

Over the last five years green companies generated higher returns than the broader equity market.

FTSE Russell's broadest green indexes have outperformed their parent benchmarks over the last five years to March 2018.

Figure 13. Outperformance of green indexes¹⁶

Index (USD)	5 yr performance total returns %	Outperformance percentage points
FTSE Environmental Opportunities All Share	74.5	+14.3
FTSE Environmental Technology 100	69.4	+9.2
Benchmark: FTSE Global All Cap	60.2	0.0
FTSE ex Fossil Fuels	65.6	+5.5
FTSE ex Coal	61.0	+0.9
Benchmark: FTSE All-World	60.1	0.0
FTSE Global Climate*	75.1	+1.8
Benchmark: FTSE All-World	73.3	0.0
FTSE Divest-Invest 200*	90.3	+13.0
Benchmark: FTSE Developed All Cap*	77.3	0.0

*(GBP)

Source: FTSE Russell, data as of March 2018. Past performance is no guarantee of future results. Returns shown before the index launch date reflect hypothetical historical performance. Please see the end for important legal disclosures.

¹⁶ Performance of FTSE Russell's most significant green indexes from March 2013 to March 2018, USD except where otherwise noted.

Conclusion

The green economy is a significant, growing, global market opportunity which is diversified across company size, geography and industry sector. The FTSE Russell Green Revenues model helps to define and quantitatively measure the transition to a sustainable and "green" economy. It can help investors understand their exposure to the green economy and implement their investment strategies. This also enables a measure of "positive impact" and can be used to define and apply green allocation priorities such as meeting Christiana Figueres' challenge to invest an incremental 1% of total assets in clean technology and renewable energy by 2020.¹⁷ No longer a loose concept the green economy is now a measurable and definable investment priority.

¹⁷ Christiana Figueres, previously executive secretary of the UN Framework Convention on Climate Change, speaking at PRI Conference in September 2017.

For more information about our indexes, please visit ftserussell.com.

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Email info@ftserussell.com

EMEA +44 (0) 20 7866 1810

North America +1 877 503 6437

Asia Pacific

HONG KONG +852 2164 3333

TOKYO +81 3 4563 6346

SYDNEY +61 (0) 2 8823 3521