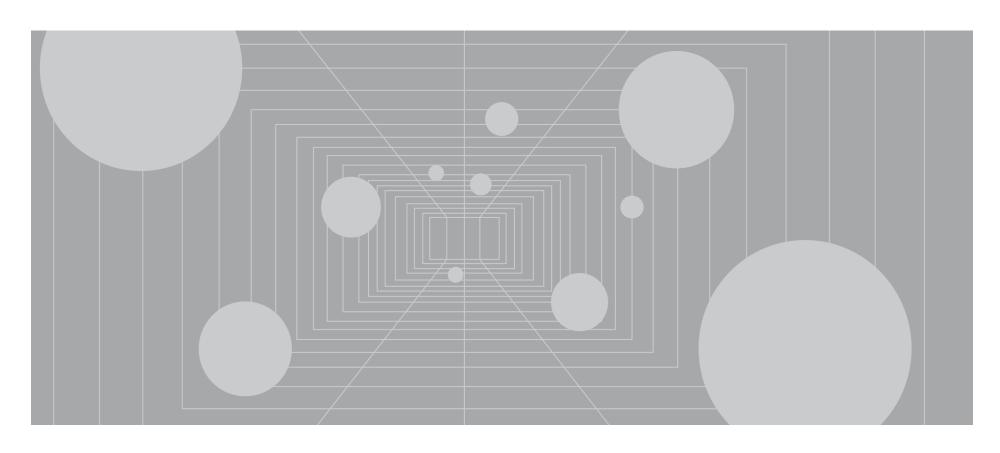
# **CLEAN TECH**

# **COMPANY PERFORMANCE STATISTICS**





# TABLE OF CONTENTS AS OF DECEMBER 31, 2018 CLEAN TECH SECTOR AND SUBSECTOR DEFINITIONS 2 DESCRIPTION OF PERFORMANCE MEASUREMENT METHODOLOGY 3 SUMMARY OF THE DATA 4 CLEAN TECH COMPANY PERFORMANCE STATISTICS Summary Analysis 6 Analysis by Geography Analysis by Stage 9 Analysis by Subsector Group 19

# **CLEAN TECH SECTOR & SUBSECTOR DEFINITIONS**

AS OF DECEMBER 31, 2018

"Clean Tech" is an umbrella term for a wide range of technologies and services. Cambridge Associates includes companies and projects in the clean tech sector if they (1) develop non-fossil fuel energy sources, (2) promote industrial efficiency by conserving resources and replacing existing processes with less-polluting alternatives, (3) recycle waste effectively and efficiently, or (4) provide a product or service that creates an environmental improvement.

GROUP	SUBSECTOR	DEFINITION		
	Solar Power Manufacturing	Technologies and processes that directly convert solar radiation into electricity or hot water		
Renewable Power Manufacturing	Wind Power Manufacturing	Technologies and processes that convert kinetic energy from the wind into electricity		
	Other Power Generation Manufacturing	Technologies and processes that generate electricity from other renewable inputs, fuel cells, or waste capture		
	Biofuels & Biomaterials	Technologies and processes that produce fuels and materials from non–fossil fuel, biomass-based sources		
Renewable Power Development	Renewable Power Development	Processes that allow for the financing, installation, management, operation, or ownership of renewable power generation projects		
	Energy Efficiency and Management	Technologies and processes that allow for more control over energy use and reduce energy consumption		
Energy Optimization	Lighting	Technologies and processes that reduce energy use through more efficient lights and lighting systems		
	Smart Grid	Technologies and processes that work to optimize electricity transmission and distribution from the point or origin to the end consumer		
	Sustainable Mobility	Technologies that contribute to the increased efficiency and electrification of transport		
	Energy Storage	Technologies and processes that increase the efficiency of or reduce the cost, weight, or environmental problems associated with devices that store energy for use at a later time		
	Waste and Recycling	Technologies and processes that repurpose old materials into new products and reduce or eliminate the quantity and impact of undesired material		
Resource Solutions	Water and Wastewater	Technologies and processes that lead to the more efficient purification, recycling, and management of water and wastewater		
	Advanced Materials	Technologies and processes that use biochemicals and substances to improve resource efficiency or serve as substitutes for more polluting materials		
	Environmental Services and Agricultural Solutions	Technologies and processes that protect and allow for the restoration of natural ecosystems or contribute to more sustainable agricultural practices and techniques. Also includes companies focused on educating consumers about environmental topics		
	Emissions Markets and Controls	Technologies and processes that reduce, measure, or control the release of greenhouse gases into the atmosphere		

## DESCRIPTION OF PERFORMANCE MEASUREMENT METHODOLOGY

AS OF DECEMBER 31, 2018

Cambridge Associates LLC (CA) has established a database to monitor the gross company-level returns of clean tech investments made by venture capital and private equity partnerships, Cambridge Associates LLC (CA) screened over 81,000 investments held by the over 7,500 funds in its Private Investments Performance Database to identify clean tech investments. The resulting clean tech sample analyzed in this report includes 1,533 investments in 950 companies across 578 funds as of December 31, 2018. Users of the analysis may find the following descriptions of the data sources and calculation techniques helpful to their interpretation of information presented in the report:

All returns included in the clean tech performance statistics are gross company-level returns and are not net of any fund management or incentive fees that may be incurred by limited partners. To approximate the difference between net-to-limited partner fund-level IRRs and clean tech gross company-level IRRs, Cambridge Associates compared the gross and net returns of 309 U.S. venture capital funds with a gross company-level return range of 0 to 10% and found the median return spread for these funds to be approximately 6.5% (650 basis points).

Partnership financial statements and narratives are the primary source of information concerning cash flows and ending residual/ net asset values (NAV) for both partnerships and portfolio company investments.

Recognizing the alternative asset community's sensitivity to the distribution of information pertaining to individual fund investments, as a matter of policy CA only releases aggregated figures in its company performance statistics report.

Year of initial investment is defined as the calendar year in which a fund made its initial investment in a portfolio company.

CA uses the since inception internal rate of return performance calculation in its performance statistics reports. The since inception internal rate of return (SI IRR) is a since inception calculation that solves for the discount rate, which makes the net present value of an investment equal to zero. The calculation is based on cash-on-cash returns over equal periods modified for the residual value of the partnership's equity or portfolio company's NAV. The residual value attributed to each respective group being measured is incorporated as its ending value. Transactions are accounted for on a quarterly basis, and annualized values are used for reporting purposes. Please note that all transactions are recorded on the 45th day or midpoint of the quarter.

### Additional Definitions:

**Distributed/Paid-In Capital Multiple** divides the total distributed gross proceeds for portfolio company investments by the total invested capital in those investments.

**Total Value/Paid-In Capital Multiple** sums the total distributed gross proceeds and total ending residual/net asset value for portfolio company investments and then divides this sum by the total invested capital in those investments.

**Pooled Gross IRR** aggregates all cash flows and ending NAVs in a sample to calculate a dollar-weighted return.

These performance statistics attempt to include only those investments generally categorized by the venture and private equity community as clean tech and do not imply that all technologies or services in the sample are equally "clean" or "high-tech." For those seeking a better understanding of the environmental cost-benefit analysis of the technologies included in this report, the National Renewable Energy Laboratory (NREL) has done research in this area (http://www.nrel.gov/).

# **SUMMARY OF THE DATA**

AS OF DECEMBER 31, 2018

Peak investment in new clean tech companies occurred in 2008; since then there has been a significant decline in the amount of first-time capital invested in new clean tech companies.

Cambridge Associates' company performance statistics include \$41.6 billion invested in private clean tech companies, \$29.8 billion in realized proceeds, and \$22.2 billion in remaining net asset value through December 31, 2018. These numbers create a gross total value/paid-in capital multiple of 1.3x, a gross distributed/paid-in capital multiple of 0.7x, and a gross internal rate of return (IRR) of 5.9%.

Investments were drawn from 578 different funds (391 venture capital funds, 171 private equity funds, and 16 infrastructure funds).

Across the four major clean tech investment groups, 18.9% of capital has been deployed in renewable power manufacturing investments, 42.5% in renewable power development investments, 17.5% in energy optimization investments, and 21.2% in resource solutions investments. On a total investment basis as of December 31, 2018, three of the four clean tech groups have achieved a positive gross IRR. Renewable Power Development had the strongest returns in gross IRR terms, returning 10.4%.

Geographically, \$26.4 billion (63.5% of capital) in the Cambridge Associates sample was invested in U.S.-based companies. Developed markets outside of the United States received \$9.2 billion of investment (22.1% of total clean tech investment), while emerging markets accounted for \$6.0 billion of investment (14.3% of total clean tech investment). United States-based companies have generated a gross company-level IRR of 4.3%, while companies based outside the United States have generated a gross IRR of 9.4%. A limited sample of emerging markets investments (158) have performed better than United States and developed ex U.S. investments.

The clean tech private investment sector remains young, and investors must therefore be cautious about drawing forward-looking conclusions from the data at this time. As the sector evolves and matures, Cambridge Associates will continue to measure company-level performance of clean tech investments across all funds on a quarterly basis.

Questions should be directed to <u>cleantechdata@cambridgeassociates.com</u>.





AS OF DECEMBER 31, 2018

### SINCE INCEPTION SUMMARY STATISTICS

Pooled Gross IRR

	POOLED GROSS IRR				NUMBER
PERFORMANCE STATISTICS	(%)	PAID-IN CAPITAL (\$B)	DPI	TVPI	OF INVESTMENTS
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	5.9	41.6	0.7	1.3	1,533
	POOLED GROSS IRR				NUMBER
BY GEOGRAPHY	(%)	PAID-IN CAPITAL (\$B)	DPI	TVPI	OF INVESTMENTS
US Clean Tech	4.3	26.4	0.7	1.2	1,115
Ex US Clean Tech	9.4	15.2	0.8	1.3	418
	POOLED GROSS IRR				NUMBER
BY STAGE	(%)	PAID-IN CAPITAL (\$B)	DPI	TVPI	OF INVESTMENTS
Early Stage Clean Tech <sup>1</sup>	0.6	11.5	0.4	1.0	906
Late Stage Clean Tech <sup>2</sup>	9.3	30.1	0.8	1.3	627
	POOLED GROSS IRR				NUMBER
PERFORMANCE STATISTICS	(%)	PAID-IN CAPITAL (\$B)	DPI	TVPI	OF INVESTMENTS
Renewable Power Manufacturing <sup>3</sup>	-9.4	7.8	0.5	0.7	443
Renewable Power Development <sup>4</sup>	10.4	17.7	0.7	1.4	195
Energy Optimization <sup>5</sup>	9.4	7.3	0.9	1.4	545
Resource Solutions <sup>6</sup>	7.0	8.8	0.8	1.4	350

Performance includes 1,533 investments in 950 companies from 578 funds and reflects gross deal level returns from 2000 to 2017.

Funds are distributed across U.S. venture capital (307 funds), non-U.S. venture capital (84 funds), U.S. private equity (92 funds), non-U.S. private equity (79 funds), and Infrastructure (16 funds).

<sup>&</sup>lt;sup>1</sup> Includes seed, start-up, and early stage investments.

<sup>&</sup>lt;sup>2</sup> Includes expansion, growth, and private equity investments.
<sup>3</sup> Example investments include solar, wind, biofuel, and fuel cell manufacturing.

<sup>&</sup>lt;sup>4</sup> Example investments include the financing, management, operation, and ownership of clean power generation projects.

Example investments include smart grid, energy efficiency, energy management, lighting, energy storage, and sustainable mobility.

Example investments include waste & recycling, water & wastewater, advanced materials, environmental services, sustainable agriculture solutions, and emissions controls.

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AS OF DECEMBER 31, 2018

### SINCE INCEPTION ANALYSIS BY YEARS OF INITIAL INVESTMENT

By Geography

TOTAL PAID-IN CAPITAL (\$B) OF COMPANIES RECEIVING INITIAL INV	VECTMENTS IN.				
TOTAL PAID-IN CAPITAL (36) OF COMPANIES RECEIVING INITIAL INV	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
US Clean Tech	1.0	13.3	4.8	7.3	26.4
Ex US Clean Tech	0.4	5.7	4.8	4.3	15.2
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	1.4	19.0	9.5	11.6	41.6
DISTRIBUTED/PAID-IN CAPITAL MULTIPLE OF COMPANIES RECEIVI	NG INITIAL INVESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
US Clean Tech	1.2	0.7	0.8	0.4	0.7
Ex US Clean Tech	4.0	0.9	0.7	0.5	0.8
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	2.0	0.8	0.7	0.4	0.7
TOTAL VALUE/PAID-IN CAPITAL MULTIPLE OF COMPANIES RECEIVI	NG INITIAL INVESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
US Clean Tech	1.3	0.9	1.6	1.5	1.2
Ex US Clean Tech	4.0	1.1	1.2	1.6	1.3
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	2.1	0.9	1.4	1.5	1.3
POOLED GROSS IRR (%)					
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
US Clean Tech	6.1	-2.9	12.5	22.0	4.3
Ex US Clean Tech	72.4	2.1	3.8	27.0	9.4

AS OF DECEMBER 31, 2018

### SINCE INCEPTION ANALYSIS BY YEARS OF INITIAL INVESTMENT

By Stage

TOTAL PAID-IN CAPITAL (\$B) OF COMPANIES RECEIVING INITIAL INVES					
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Early Stage Clean Tech <sup>1</sup>	0.9	6.4	2.3	1.8	11.5
Late Stage Clean Tech <sup>2</sup>	0.5	12.6	7.2	9.8	30.1
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	1.4	19.0	9.5	11.6	41.6
DISTRIBUTED/PAID-IN CAPITAL MULTIPLE OF COMPANIES RECEIVING	INITIAL INVESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Early Stage Clean Tech <sup>1</sup>	1.0	0.3	0.5	0.4	0.4
Late Stage Clean Tech <sup>2</sup>	3.9	1.0	0.8	0.4	0.8
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	2.0	0.8	0.7	0.4	0.7
TOTAL VALUE/PAID-IN CAPITAL MULTIPLE OF COMPANIES RECEIVING	INITIAL INVESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Early Stage Clean Tech <sup>1</sup>	1.1	0.6	1.7	1.8	1.0
Late Stage Clean Tech <sup>2</sup>	3.9	1.1	1.3	1.5	1.3
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	2.1	0.9	1.4	1.5	1.3
POOLED GROSS IRR (%)					
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Early Stage Clean Tech <sup>1</sup>	2.0	-8.3	11.4	26.1	0.6
Late Stage Clean Tech <sup>2</sup>	67.1	3.0	7.3	23.3	9.3

<sup>&</sup>lt;sup>2</sup> Includes expansion, growth, and private equity investments.



funds).

<sup>&</sup>lt;sup>1</sup> Includes seed, start-up, and early stage investments.

AS OF DECEMBER 31, 2018

### SINCE INCEPTION ANALYSIS BY YEARS OF INITIAL INVESTMENT

By Subsector Group

TOTAL PAID-IN CAPITAL (\$B) OF COMPANIES RECEIVING INITIAL INV	ESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017
Renewable Power Manufacturing <sup>1</sup>	0.5	5.6	1.6	0.1	7.8
Renewable Power Development <sup>2</sup>	NA	6.2	3.3	8.0	17.6
Energy Optimization <sup>3</sup>	0.7	3.4	2.0	1.1	7.2
Resource Solutions <sup>4</sup>	NA	3.8	2.6	2.3	8.8
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	1.4	19.0	9.5	11.6	41.6
DISTRIBUTED/PAID-IN CAPITAL MULTIPLE OF COMPANIES RECEIVIN	NG INITIAL INVESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Renewable Power Manufacturing <sup>1</sup>	1.7	0.5	0.3	0.1	0.5
Renewable Power Development <sup>2</sup>	NA	1.1	0.9	0.3	0.7
Energy Optimization <sup>3</sup>	2.2	0.7	0.8	0.9	0.9
Resource Solutions <sup>4</sup>	NA	0.9	0.7	0.5	0.8
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	2.0	0.8	0.7	0.4	0.7
TOTAL VALUE/PAID-IN CAPITAL MULTIPLE OF COMPANIES RECEIVIN	NG INITIAL INVESTMENTS IN:				
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Renewable Power Manufacturing <sup>1</sup>	2.0	0.6	0.5	1.0	0.7
Renewable Power Development <sup>2</sup>	NA	1.2	1.6	1.4	1.4
Energy Optimization <sup>3</sup>	2.2	1.0	1.4	2.0	1.4
Resource Solutions <sup>4</sup>	NA	1.1	1.7	1.7	1.4
CAMBRIDGE ASSOCIATES GLOBAL CLEAN TECH	2.1	0.9	1.4	1.5	1.3
POOLED GROSS IRR (%)					
	2000-2004	2005-2009	2010-2013	2014-2017	TOTAL (2000-2017)
Renewable Power Manufacturing <sup>1</sup>	42.2	-9.9	-13.6	1.4	-9.4
Renewable Power Development <sup>2</sup>	NA	4.0	14.1	21.4	10.4
Energy Optimization <sup>3</sup>	31.6	-0.2	8.5	37.0	9.4
					7.0
Resource Solutions <sup>4</sup>	NA	1.0	12.4	24.6	7.0

NA Indicates inadequate number of companies in sample. Companies in NA columns will contribute to Total (2000 - 2017).

Performance includes 1,533 investments in 950 companies from 578 funds and reflects gross deal level returns from 2000 to 2017.

Funds are distributed across U.S. venture capital (307 funds), non-U.S. venture capital (84 funds), U.S. private equity (92 funds), non-U.S. private equity (79 funds), and Infrastructure (16 funds).

<sup>&</sup>lt;sup>1</sup> Example investments include solar, wind, biofuel, and fuel cell manufacturing.

<sup>&</sup>lt;sup>2</sup> Example investments include the financing, management, operation, and ownership of clean power generation projects.

<sup>&</sup>lt;sup>3</sup> Example investments include smart grid, energy efficiency, energy management, lighting, energy storage, and sustainable mobility.

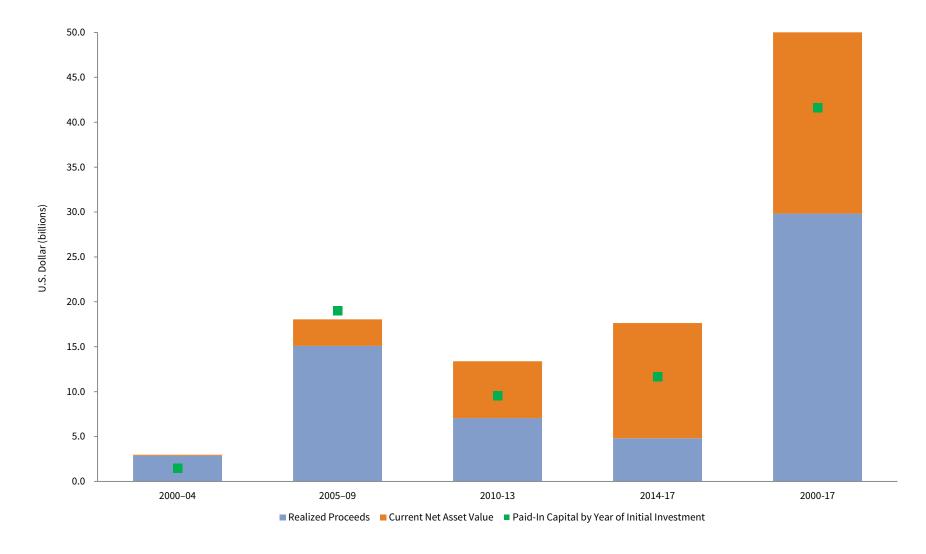
<sup>&</sup>lt;sup>4</sup> Example investments include waste & recycling, water & wastewater, advanced materials, environmental services, sustainable agriculture solutions, and emissions controls. Source: ©2019 Cambridge Associates Private Investments Database. Cambridge Associates LLC, all rights reserved.

# **CLEAN TECH EXHIBITS**





### SINCE INCEPTION ANALYSIS: PERFORMANCE BY YEARS OF INITIAL INVESTMENT



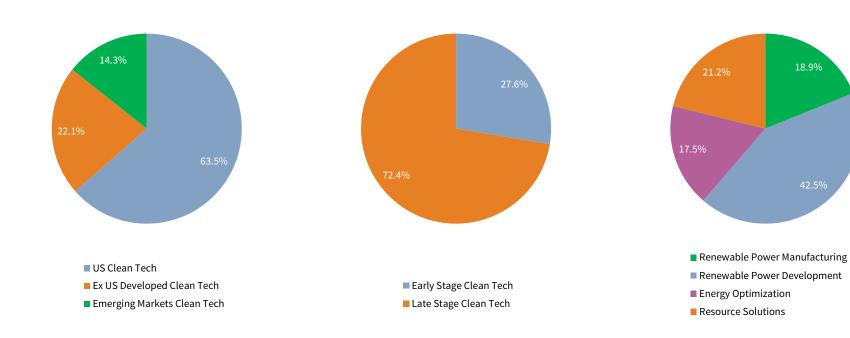
# **CLEAN TECH EXHIBITS**

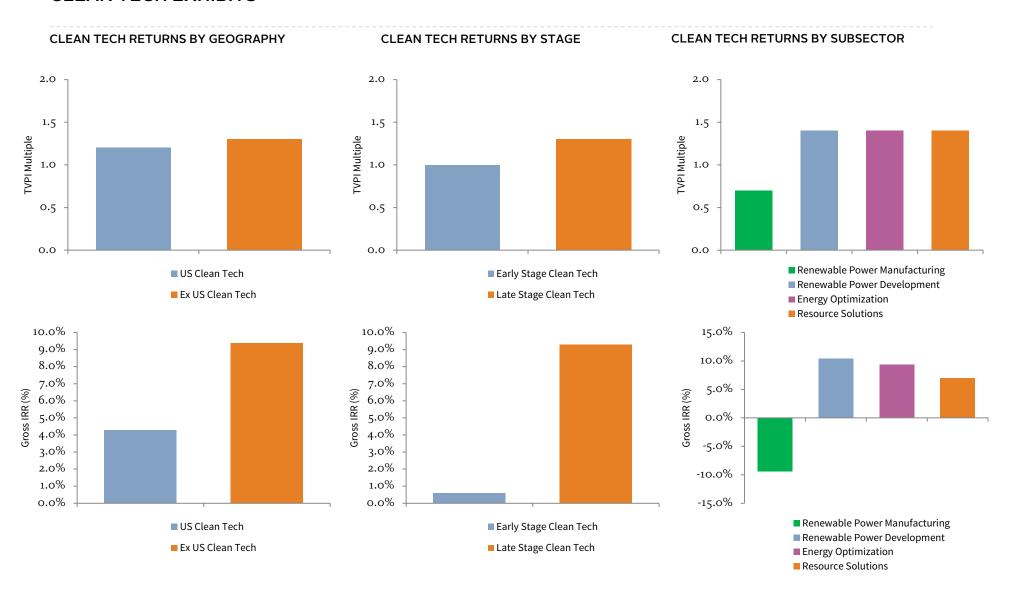
AS OF DECEMBER 31, 2018

### **CLEAN TECH RETURNS BY GEOGRAPHY**

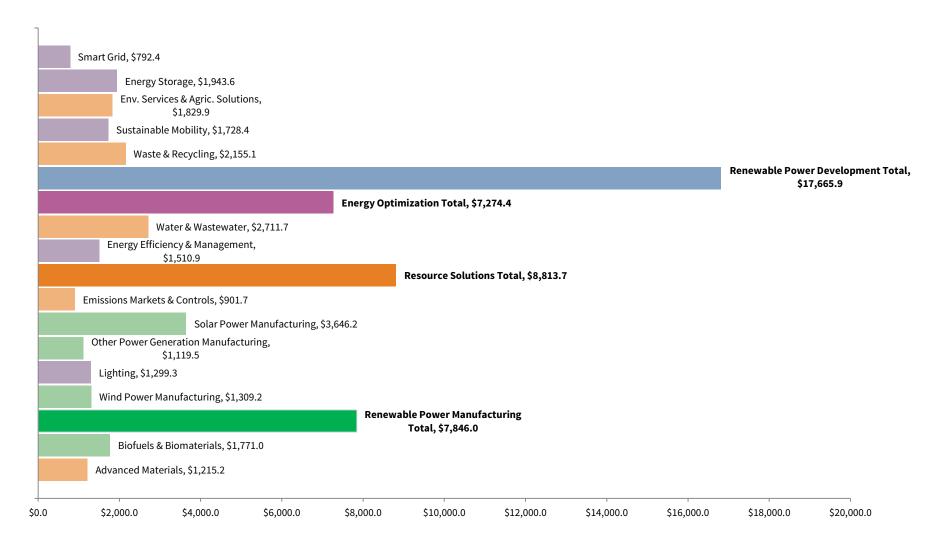
### **CLEAN TECH RETURNS BY STAGE**

### **CLEAN TECH RETURNS BY SUBSECTOR**



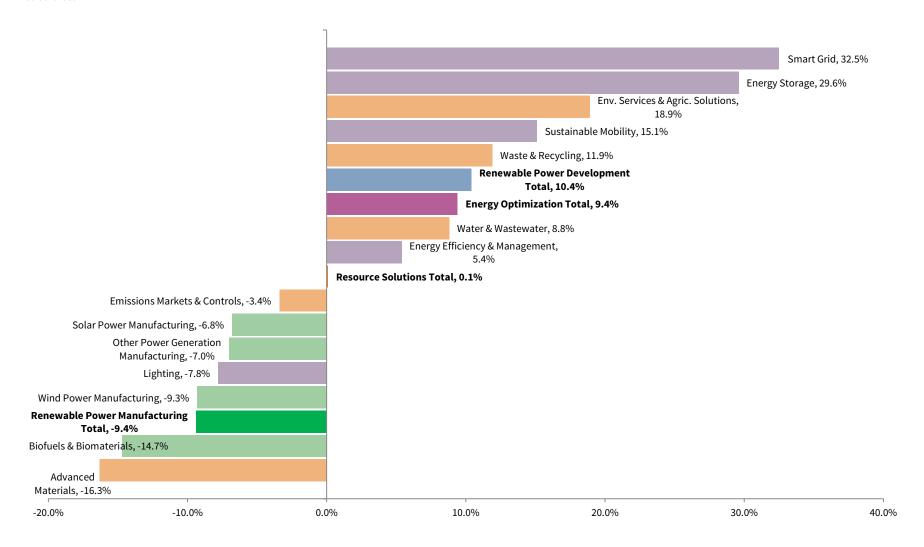


### SINCE INCEPTION INVESTED CAPITAL BY CLEAN TECH SUBSECTOR (\$ MILLIONS)



### SINCE INCEPTION IRR BY CLEAN TECH SUBSECTOR

Pooled Gross IRR



# NOTE ON PERFORMANCE DATABASE CHANGES

AS OF DECEMBER 31, 2018

Our goal is to provide you with the most accurate and relevant performance information possible; as a result, Cambridge Associates' private investments performance database will continually reflect changes to the underlying pool of contributing funds and clean technology company investments.

As these changes occur, you may notice quarter to quarter changes in the results of some historical benchmark return analyses.



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