cleantech GROUP LLC

Global Cleantech 100

A Barometer of the Changing Face of Global Cleantech Innovation

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For the third year in a row, we are proud to present you with this list of the top 100 private companies in clean technology. We'll be watching these companies closely over the next year and we're excited to be a milestone in their growth.

Cleantech Group has been tracking innovation and financing in the sector since 2002 and since then we've been dedicated to accelerating the adoption of these critically important technologies. We congratulate this year's winners, and the smart investors and corporations who recognize the potential in cleantech.

It is our mission to help the world's top enterprises, investors and governments connect with cleantech innovation. We serve this community with the i3 research platform, world-class Forums and custom advisory services.

Please let us know how we can help you connect with innovation,

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Acknowledgements

There is a lot of work involved and support given for the annual Global Cleantech 100 to come together. We would like to acknowledge and give thanks accordingly.

Firstly, the list and this report would not have been possible without the support of our three sponsoring partners – namely, Autodesk, Deloitte and Wilson Sonsini Goodrich & Rosati, all of whom are highly supportive of our work, and the development and nurturing of the clean technology innovation ecosystem in general.

Secondly, the list would not have been possible but for the willingness of our 70-strong expert panel (listed in Appendix 1) to give up their time during the summer months to provide expert input and opinion. This is in addition to the many hundreds who made company nominations. Thank you all.

Thirdly, an acknowledgement of our partner. The Global Cleantech 100 list is produced by Cleantech Group, as part of a wider Global Cleantech 100 global program, which is jointly-created with the UK's Guardian News and Media. This program includes an online supplement produced by the Guardian, and the Guardian Cleantech Summit held annually in November in London, this year on November 22nd. See http://www.guardian.co.uk/cleantech-summit for more.

Finally, the Cleantech Group team. Many people made small contributions, but particular thanks are due to Vince Knowles, one of our London-based research analysts, with noteworthy contributions from Daniel Coles, Amanda Faulkner, Jonathan Hardinges, Shawn Jaswal, Ben Pitt, and Christopher Reid; and Whitney Michael, Director of Marketing.

Disclaimer

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Foreword from Cleantech Group

The annual Global Cleantech 100 provides a read on how the cleantech innovation ecosystem's views are changing over time. Yes, it is a list of 100 highly promising companies. And yes, each of us will argue long and hard as to the merits of certain companies who are included or excluded in each year's list. However, because the list represents the weighted collective opinion of hundreds of industry insiders from around the world, it can reasonably act as a bellwether for what has happened in the last year and as an early indicator of emerging and growing trends.

No list of global cleantech companies could be perfect. Some parts of cleantech are more mature than others. Some geographies do not have the culture or history of building companies like Silicon Valley, for example. However, the list can be broadly representative, and therefore can provide an annual barometer reading of the global innovation community's shifting views on which companies, and which types of companies, are most likely to have big commercial impact in a 5-10 year timeframe.

In that spirit, we humbly present our annual report to you as an invaluable instrument to discover, and chart the growth of, those companies, who are leading the next wave of disruption and innovation in the world of cleantech.

Richard Youngman
MD, Europe & Asia, Cleantech Group

Vince Knowles
Research Analyst, Cleantech Group

Foreword from Deloitte

Worldwide, thousands of cleantech companies take the idea of a greener future as their day to day challenge. Candidates for future Global Cleantech 100 reports seemingly emerge every week from locales as diverse as Silicon Valley, Zhongguancun, and Haifa, in a wide array of sectors.

Although the amount of change in the names on this list is significant, and understandable, it is nevertheless an impressive group, and one whose efforts promise – and have often delivered – great things. The Global Cleantech 100 companies stand as exemplars of the persistence and ingenuity – indeed, the imagination, resilience, and vigor – of the innovation ecosystem. These companies represent the potential of cleantech markets – the ability of companies to reshape entire industries and economies.

Working with extraordinary cleantech companies every day, Deloitte member firm professionals can appreciate the difficult task the Cleantech Group and the expert panel had in narrowing the field to just 100 businesses to feature. Cleantech companies face tremendous challenges when entering, partnering, acquiring, or being acquired in different markets, and acquit themselves (on an ever more global stage) admirably. Real wealth is being generated. New paths to a sustainable future are being created. And thus the narrative of the Global Cleantech 100 – of growth along myriad pathways toward a common goal of using technology to reshape our future for the better – is a story that begs to be told.

David Pearson
Global Cleantech Leader
Deloitte Touche Tohmatsu Limited

Jason Rissanen
US Cleantech Leader
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Our focus on clean tech

Supporting the growth of technology and innovation

The member firms of Deloitte Touche Tohmatsu Limited are leaders in serving clean tech companies. Our extensive experience working with clients in a broad range of industries — energy, utilities, technology, manufacturing, and biotechnology — arms our practitioners with the insight to provide solutions to complex issues that clean tech companies face.

We advise clients on a broad range of audit and enterprise risk, tax, consulting, enterprise sustainability, and financial advisory issues to support the growth of clean tech companies worldwide.

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The Headlines

This report not only unveils the 100 companies of 2011, but also analyzes the list's composition and dynamics, and the changes from the 2010 list. The key headlines are as follows.

Opinions on who, or what, constitutes the most attractive market opportunities and the most promising companies remain volatile, though less so than last year. Of the 100 companies in the 2011 Global Cleantech 100 list, 58 were in the 2010 list. High turnover is consistent with the relative infancy of the cleantech wave of innovation. We are all learning and adjusting our viewpoints as we go. External forces, such as financial market sentiment and government decisions (on feed in tariffs, subsidies, and stimulus funding), continue to have significant and rapid impact on fashions and fortunes.

16 countries are represented in the 2011 list, a clear reminder of how geographically-diverse and international, cleantech innovation is. The US, led by California, remains the dominant country, a reflection of its leadership and history in creating and growing, venture capital-funded, innovation-based, technology companies. However, when looking at the concentration of companies per trillion dollars of GDP, the strong relative showing from small countries such as Denmark, Israel, the Netherlands and Sweden becomes apparent.

Energy Efficiency remains the hottest sub-sector within cleantech, with 19 companies in the list, up from 15 last year. Broader cleantech and resource efficiency solutions, not only renewable energy generation, have become more important and are represented by a significant increase in representation of water and materials companies. Further, we expect the percentage of solar and biofuels companies to fall over the next few years, as these areas mature, markets consolidate, and the class of the early 2000's reach some sort of exit.

Over 350 investing entities, from 28 different countries, have a shareholding in the 100 companies. **Kleiner Perkins is the most prolific shareholder of 2011 Global Cleantech 100 companies.** It has 14 investee companies in the list, overtaking this year VantagePoint Capital Partners' 12. Other funds – such as Environmental Technologies Fund, Foundation Capital, Generation Investment Management and VantagePoint Capital Partners – stand out for having more than a third of their cleantech private company portfolio in this list.

Corporations continue to become ever more active in global cleantech innovation – as investors, partners, licensees, customers, and acquirers of Global Cleantech 100 companies. GE and Siemens are the most active partners with 2011 Global Cleantech 100 companies.

TaKaDu heads the 2011 Global Cleantech 100 'Lust List'. The Lust List is made up of the companies who were most consistently admired by non-stakeholder peers, with no dissenters among the expert panel. The four other companies who made the 2011 Lust List this year were Coulomb Technologies, Hara, Opower and Silver Spring Networks. LanzaTech topped the charts for the Asia-Pacific region.

Better Place is the 2011 Global Cleantech 100 company that most strongly divided opinion across our expert panel: you either love it or you hate it, it seems. It headed the 2011 'Marmite List'. [1]

[1] The idea of the 'Marmite' list is inspired by a Unilever food product, Marmite, that has famously divided tastes since being introduced to the market 100 years ago. So much so that 'You either love it or you hate it' has become part of the marketing! http://www.unilever.co.uk/brands/foodbrands/marmite.aspx

Methodology: how does the list come together?

The Global Cleantech 100 is designed to achieve two unique things to make it distinctive from other lists: to give fair representation to global innovation and private company creation, and to represent not Cleantech Group's editorial voice and opinion, but that of hundreds of people within the wider global cleantech innovation community.

The question we are seeking to answer is:

According to the world's cleantech community, which 100 of today's private cleantech companies are the most likely to make the most significant market impact over the next 5-10 years?

The answer is derived by Cleantech Group drawing on its own data and research, and combining it with the weighted qualitative judgments of hundreds of people, and the viewpoints of an expert panel. To be on the list, companies must be independent, for-profit, cleantech companies that are not listed on any major stock exchange.

The process we run is analogous to that of a two-stage presidential election, or a reality TV show, using a combination of wider input and narrow expert judging. The process runs in two stages.

During phase 1, a long list is built from both active nominations made by hundreds of worldwide experts Cleantech Group reaches every week through its online and offline media, and from passive nominations and validations. The latter are derived from analyzing a wealth of market data, taking 'votes of confidence' in a company's ability to achieve high growth and high market impact from market transactions such as investment rounds, and major customer and partnership announcements, as well as leveraging the results of over 130 (up from 50 in 2010) third party awards and rankings, where expert assessment has already been applied, with criteria relevant to the question we are asking.

In this way, in 2011, 6,652 nominations were received (an increase of 2,036 from 2010), giving us a long list of 4,274 companies (a 36% increase on 2010). A weighting and filter system was then applied to collate the results, score each company, and reduce the candidates to a short-list of 213 companies to present to the expert panel in phase 2.

The scoring system rewards companies who have multiple validations, to align with our objective to synthesize and represent collective opinion. Another key objective is to produce a Global Cleantech 100 that truly represents the breadth of cleantech innovation companies, from Agriculture to Wind, from California to China. To counter geographical and sectoral bias, a weighting system is used to keep the list within general bands, so that the end list cannot be all solar or renewable companies, or all American or European companies, for example. Geographies and sectors are weighted by their proportionality in cleantech. The weightings used are derived from Cleantech Group data on the number of companies of the global total that any particular geography or sub-sector represents.

In phase 2, members of an expert panel are each given a limited number of votes they can use to voice a strong opinion, be that positive or negative, to strengthen or weaken a shortlisted company's case for making the final 100. The scores from phase 1 are carried through, so the end result is a combination of the two. At all points, voting is blind and remote, meaning expert panellists, do not know where any one company is ranked after phase 1, or what other expert panellists are doing or saying. This is to counter tactical voting and to prevent anyone being unduly influenced by others, which we have witnessed happening in physically-convened panels and editorial meetings.

The expert panel is made up of 70 individuals, drawn principally from leading investors in Asia, Europe and North America, and from representatives of multi-nationals from a deliberately-varied (and balanced) set of industrial backgrounds. It includes pioneers, leaders, rising stars, and new entrants in cleantech; the names are to be found in Appendix 1.

The composition of the expert panel, in alignment with our weighting system, is created to be broadly representative of the global cleantech community, reinforcing the intended outcome that the end result should be a list in which all, or most, sub-sectors of cleantech are represented, and many countries have the chance to be represented, in approximate proportionality to their share of the overall number of innovative, private cleantech companies in the world.

A core principle of the approach throughout is to counter commercial bias by forcing participants to nominate companies where they are not a stakeholder. For every company anyone nominates that they have an association with, they must nominate two others where they do not, but which they admire. For example, an investor's input was only accepted if, for every portfolio company they put forward, they also nominated at least two others where they are not shareholders. We call this the 'Lust List' principle.

The end result is a list of companies that command a broad base of respect and support from many players within the global cleantech innovation ecosystem, not just insiders. Clearly, there are many, fine companies who are not on the 2011 list. They may be waiting to be discovered by a broader pool of people, they may be out of favor this year, their time is still to come (or to come again, in the case of those who have fallen off from the 2009 or 2010 lists); or they may simply have just missed the cut. Only so many companies can be on the list.

Thank you to all those who participated, especially to the expert panelists who gave up considerable time to deliver on our requests. The Global Cleantech 100 is not just Cleantech Group's list, but all of ours. We look forward to your feedback.

Full profiles of all Global Cleantech 100 Companies now in i3

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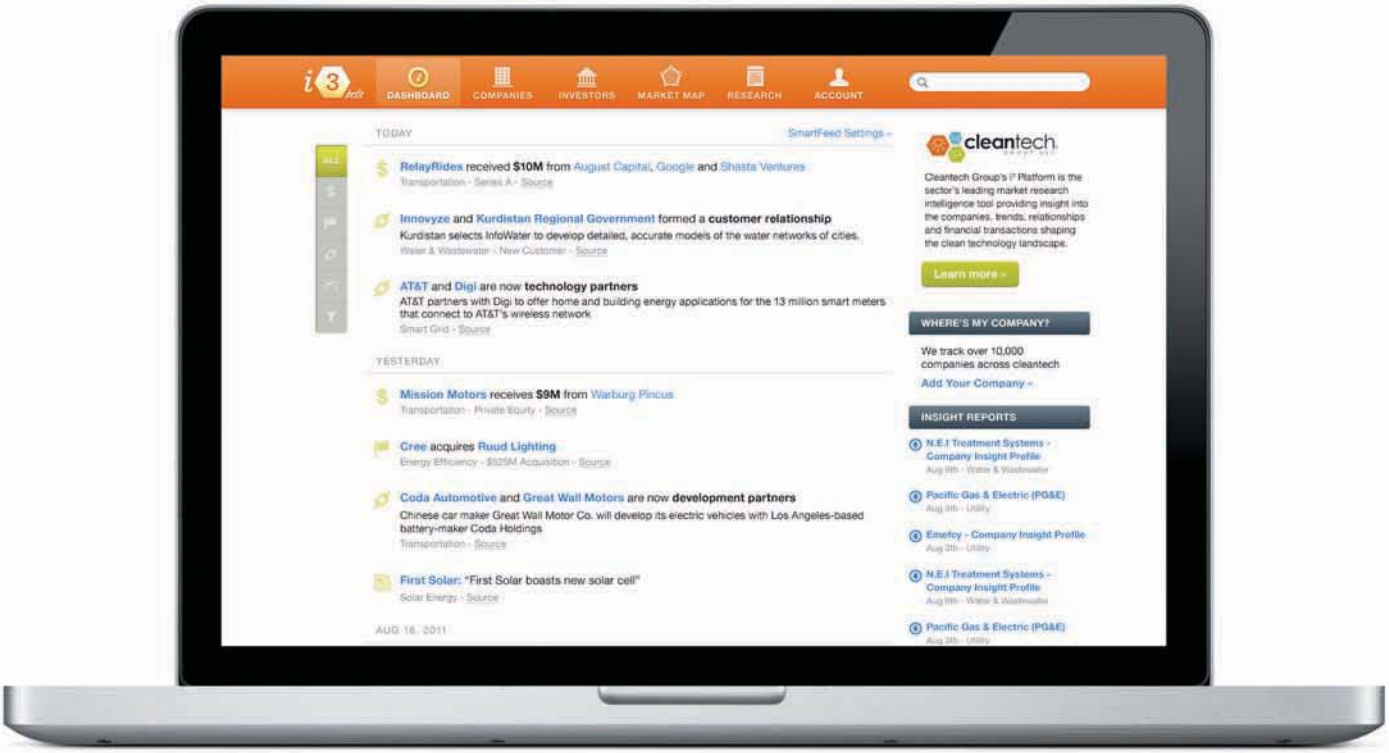
insight into innovation



"Incredibly dynamic platform, rich in content and easy to use, i3 becomes an essential tool in the Cleantech investment sector, not only as a source of immediate information, but also as a trend analysis tool that allows future forecasts."

- Marta Grech, Demeter Partners

Global corporations, investors and clean technology power players have long relied on Cleantech Group's knowledge, understanding of the sector, and strong relationships in the community.

Now we've built a web tool to share our insights with you.

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The 2011 Global Cleantech 100

The companies are listed in alphabetical order, with new entrants for 2011 highlighted in red and re-entries from 2009 (who were not on the 2010 list) highlighted in **blue**.

1366 Technologies
24M Technologies
4Energy
Adura Technologies
Agilyx
Amantys
AMEE
Amminex
Amprius
APTwater
Aqwise
Attero Recycling
Avantium
Barefoot Power
Better Place
BioAmber
Boston-Power
Bridgelux
BrightSource Energy
Canatu
Chemrec
ClimateWell
Compact Power Motors
Coulomb Technologies
Digital Lumens
Electrawinds
Elevance Renewable Sciences
Emefcy
eMeter
Enecsys
EnOcean
Enphase Energy
eSolar
EVO Electric
FilterBoxx
Fisker Automotive
General Compression
Genomatica
GMZ Energy
Green Biologics
GreenRoad Technologies
Hara
Harvest Power
Heliatek
Helveta
HydroPoint Data Systems
Ioxus
JouleX
Kaiima
Kebony
LanzaTech
LatticePower
Lemnis Lighting
LS9
McPhy Energy
MiaSolé
Mission Motors
NanoH2O
Nexant
Nexterra
Nobao Renewable Energy Holdings
Novacem
Novomer
Nujira
Oasys Water
O-Flexx Technologies
On-Ramp Wireless
Opower
Ostara Nutrient Recovery Technologies
Project Frog
Puralytics
Purfresh
Recupyl
Recyclebank
RelayRides
Sakti3
SCIenergy (fka Scientific Conservation)
Seeo
ShineOn
Silver Spring Networks
Solairedirect
SolarCity
Soltecture (fka Sulfurcell)
Stirling DK
Suniva
SunRun
SustainX
SynapSense
Synthetic Genomics
TaKaDu
Tendril
Tigo Energy
Topell Energy
Transphorm
Trilliant
Voltea
WaterHealth
Windlab Systems
Xtreme Power
ZeaChem

Who are the 2011 Global Cleantech 100?

Of the companies in the 2011 list, 58 also featured in the 2010 list, along with 29 which featured in the 2009 list. Twenty-four companies have featured in all three years of the Global Cleantech 100, while five featured in 2009, dropped out in 2010 and have re-entered in 2011. With 37 debutants and five re-entries from 2009, this year's list saw less turnover than 2010, which had 57 new entrants.

Who are the world's leading cleantech companies?

The table below shows the top 10 companies within each major region – those companies who attracted the broadest base of support from the world's cleantech community. They are presented in alphabetical order.

The top ranked company in each region - who had the highest rating and the most positive votes from our expert panel without any detractors or negative votes - is shown in bold.

North America Top 10	Europe and Israel Top 10	Asia Pacific Top 10
BrightSource Energy	Avantium	Attero Recycling
Coulomb Technologies	ClimateWell	Barefoot Power
eMeter	Compact Power Motors	Giga Solar Materials*
Enphase Energy	Emefcy	Hengfu Logistics*
eSolar	Enecsys	**LanzaTech**
Hara	EnOcean	LatticePower
Oasys Water	Green Biologics	Miartech*
Opower	Novacem	Nobao Renewable Energy Holdings
Ostara Nutrient Recovery Technologies	**TaKaDu**	ShineOn
Silver Spring Networks	Voltea	Windlab Systems

*For the Asia Pacific region, Giga Solar Materials, Hengfu Logistics and Miartech were taken from outside the top 100 to make the regional top 10. These 3 were the highest ranked Asia Pacific companies on the shortlist that did not make the final 100.

Where are the Global Cleantech 100 based?

The 100 companies are based in 16 countries throughout the world, compared to 14 in 2010 and 13 in 2009. Switzerland lost its representation (Landis+Gyr was acquired by Toshiba making it ineligible and ReVolt Technology did not make the top 100 this year), whereas Belgium, Finland and Australia now have companies in the 100 – for the first time in all three cases.

North America entrenched its global leadership in founding and growing cleantech innovation companies, by being home to 61% of this year's companies, up from 57% last year*. Asia Pacific was stable at 7% while Europe and Israel absorbed North America's gains, dropping from 36% to 32%.

*It is important to note that 2 of the 3 companies gained by the US on last year are due to re-classifications. In prior years, we have classified Better Place and WaterHealth as being from Israel and India respectively. Rightly or wrongly, we now assess their corporate HQ's and their key executives to be in the US, further demonstrating the attraction of the US as a place to both create innovation and to take it from other countries, such is the concentration of experienced innovation capital, human and financial.

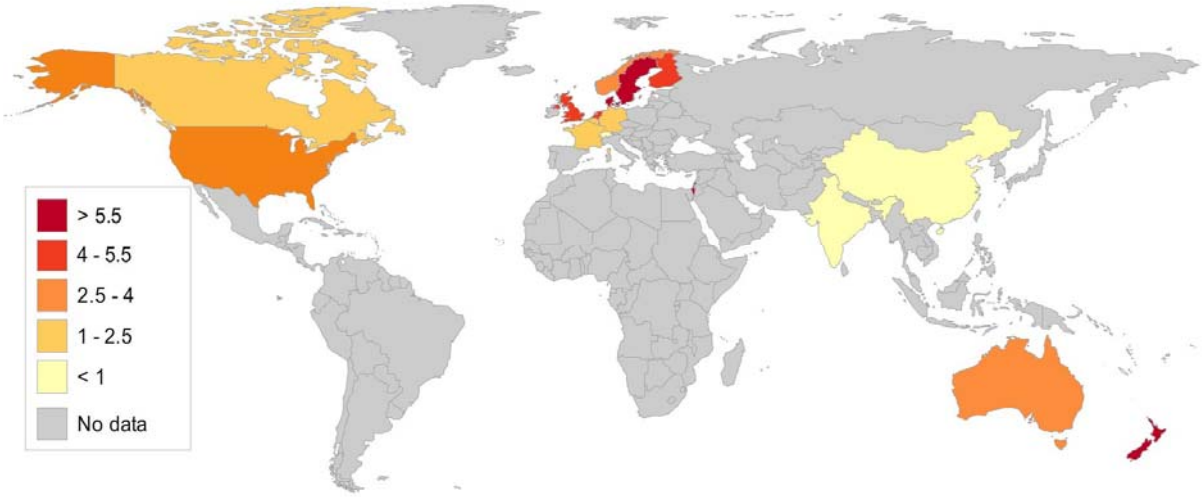
Country	Companies in 2010	Companies in 2011	Change 2010 to 2011	2011 GC100 Companies per Trillion $ GDP*
USA	55	58	+3	4.1
United Kingdom	11	9	-2	4.4
Germany	7	5	-2	1.7
Israel	5	4	-1	19.6
Netherlands	2	4	+2	5.4
China	3	3	0	0.6
Canada	2	3	+1	2.4
France	2	3	+1	1.2
Denmark	3	2	-1	6.9
Sweden	2	2	0	5.5
Australia	0	2	+2	2.7
India	3	1	-2	0.8
Norway	2	1	-1	2.8
New Zealand	1	1	0	11.3
Belgium	0	1	+1	2.3
Finland	0	1	+1	4.3
Switzerland	2	0	-2	0

*2010 GDP in US Dollars from IMF estimates

Within the United States only, 36 of the 58 companies are based in California, an increase of three from 2010 and a signal that Silicon Valley's position as *the* global hotspot of innovation remains. For a second year running Massachusetts was the only other state to have more than two companies represented, with nine in the list.

However when we account for the size of economy by analyzing company numbers by GDP, a very different picture emerges. Fifty-eight top cleantech companies emerging from the US is less impressive, given that it is the largest economy in the world. The results show a number of small countries that are punching above their weight in contributing to global cleantech innovation. Denmark, Israel, Sweden and the Netherlands stand out in this regard. While New Zealand also scored highly in this regard, it is on the basis of only a single company.

The concentration of leading cleantech companies across countries is visualized in the following map which depicts the number of companies in the 2011 list per Trillion $ GDP*. The darker colours point to a greater concentration of cleantech innovation companies, relative to the overall size of the economy. For China and India, both significant and growing forces in cleantech, the map indicates that they have a long way to go in terms of their founding and growing of home-grown cleantech start-ups on the international stage.



Source: Cleantech Group Analysis

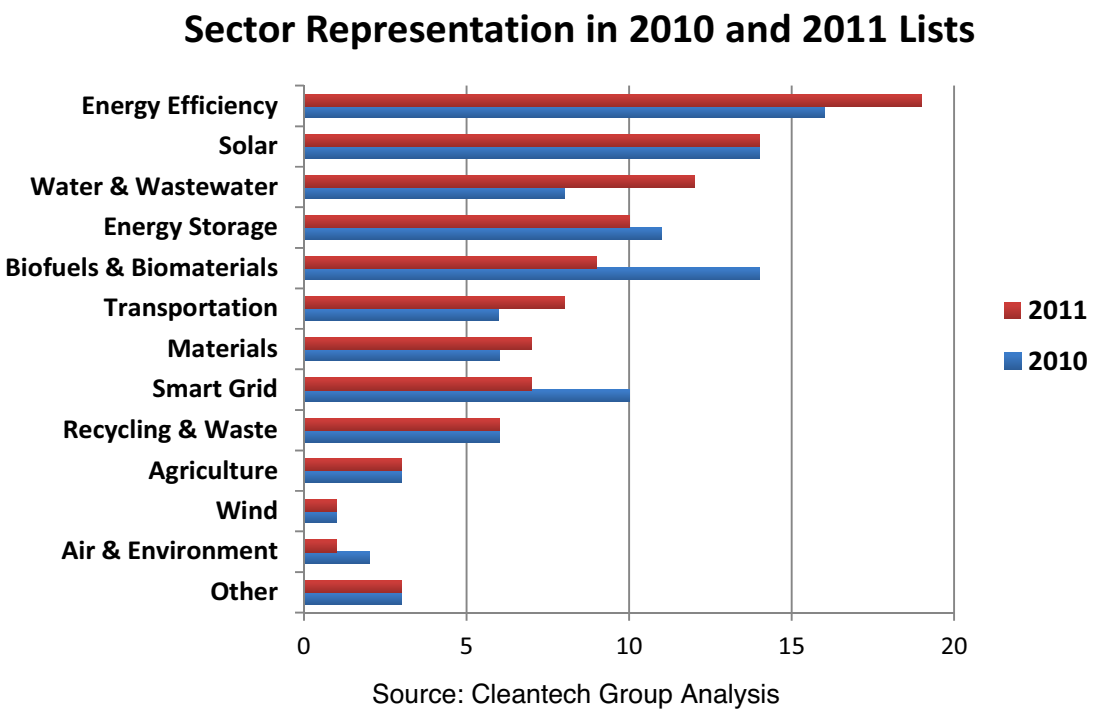
In which sectors do the Global Cleantech 100 operate?

For a second year running, the broad Energy Efficiency theme has held its position as the top sub-sector, increasing its share to 19%. While Solar held its second place, Water & Wastewater jumped up by four companies to become the third most represented sector with 12% of the list.

Sector	Companies in 2010	Companies in 2011	Change 2010 to 2011
Energy Efficiency	16	19	+3
Solar	14	14	0
Water & Wastewater	8	12	+4
Energy Storage	11	10	-1
Biofuels & Biomaterials	14	9	-5
Transportation	6	8	+2
Smart Grid	10	7	-3
Materials	6	7	+1
Recycling & Waste	6	6	0
Agriculture	3	3	0
Air & Environment	2	1	-1
Wind	1	1	0
Other	3	3	0

Gains for Energy Efficiency and Water contrasted with notable drops for Biofuels & Biomaterials and Smart Grid, which 'lost' five and three companies respectively. Wave/Tidal Energy Generation lost its representation altogether, with last year's only company Aquamarine Power dropping off this year. It would seem that the broad majority are still to be won over to these companies, as we await the first one to prove out the technology in the water and to show a good return on investment can be made for private investors.

The poorer showing for biofuels and biomaterials companies cannot be attributed to problems with technology or a lack of returns. Three biofuels/biomaterials companies from the 2010 list have IPO'd. Amyris Biotechnologies, Gevo, and Solazyme accounted for all but one of the IPO exits for 2010 Global Cleantech 100 companies. As public companies these three were not eligible for the 2011 list, taking a 'natural' dent out of the numbers for their sector. These IPO's, along with those of Codexis and KiOR, signal a maturation in the biofuels sector suggesting fewer biofuels companies in the Global Cleantech 100 in years to come. Or at least fewer biofuels companies of this nature. There are likely to still be some IP plays into the area, onto the platforms that have been created by these pioneering end-to-end companies.



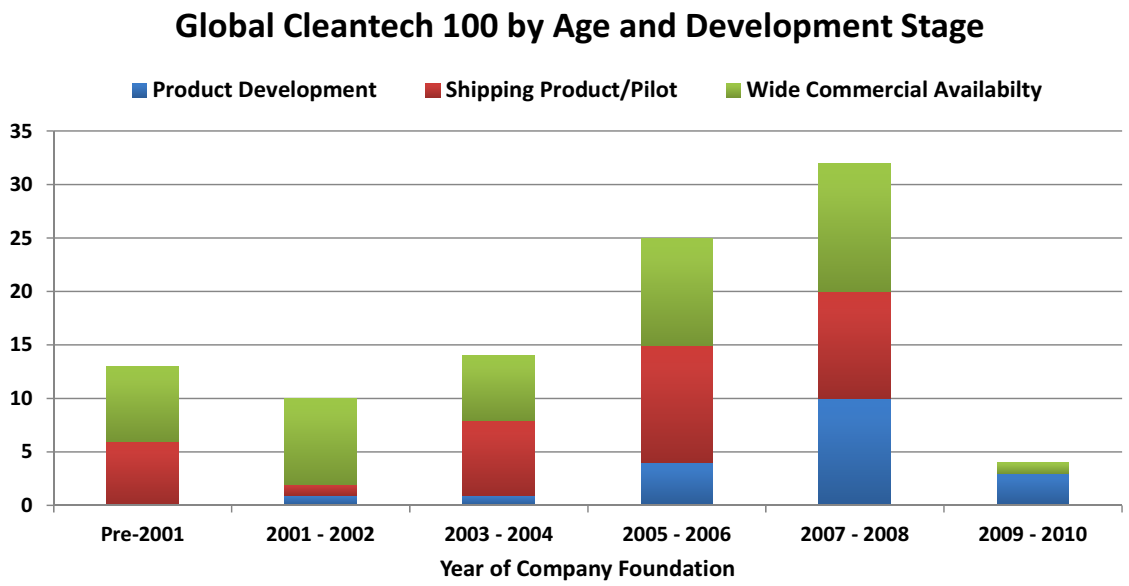
Source: Cleantech Group Analysis

At what age and development stage are the Global Cleantech 100?

The mean foundation year for the global portfolio is 2004, with only eight companies founded before 2000.

Two of the 100 were founded as recently as 2010. It is noteworthy for such young and 'unproven' companies to gain sufficient support from within the market to make the list, for two reasons: one, they have no real track record and two, the list has a 5-10 year timeframe for significant market impact.

Newer companies get noticed because of their technological promise, origins, and experienced management teams. In the case of 24M Technologies, an energy storage spin-out from A123 Systems, the company is in stealth mode but is still recognised for having a genuine potential to develop a breakthrough from its work combining lithium ion and flow battery technologies. Amantys, a spin-out from the University of Cambridge, is commercializing a digital power switching platform to address power losses within the device and the whole supply chain. Its connections to ARM Holdings plc are noteworthy.

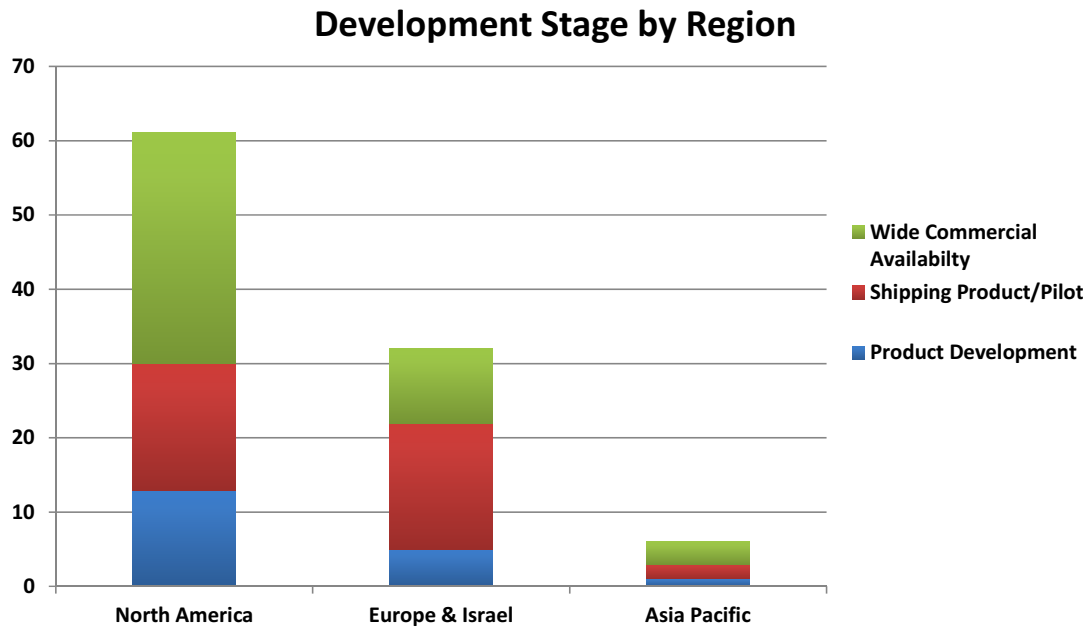


Source: Cleantech Group Analysis

When classified based on development stage, our data shows that 19 companies are still in product development, 37 have a pilot or product with limited availability and 44 have products that are widely commercially available. Unsurprisingly, companies founded more recently tend to be at an earlier development stage, however there are notable exceptions. Harvest Power was only founded in 2008 but its products are already widely commercially available, with a contract to provide organic waste management services for 22 municipalities in British Columbia, Canada. Another fast mover has been JouleX, which was set up in 2009 and has products with wide commercial availability. In less than two years, the US company has moved strongly into the data centre energy management market and established partnerships with Cisco, Intel and Siemens, among others.

In contrast to these young companies' rapid development, there are much older companies still at relatively early stages. The oldest is ZeaChem, which was established in 2002 and nine years later is still in product development phase. However this is less remarkable given that ZeaChem is a biofuels company and so subject to typically long development cycles. The specific demands of the different sub-sectors under the cleantech umbrella can be seen in the age and development stage of companies featured in the 100, as biofuels and biomaterials companies have an average founding year of 2003 and only 11% with widely commercially available products, compared to an average founding of 2005 and 79% at wide commercial availability for energy efficiency companies.

A similar observation of differing commercial trajectories can be made of the regions represented in the list. The North American companies were on average founded in 2005 and 51% are at wide commercial availability, whereas for Europe and Israel the corresponding figures are 2004 and only 31%, showing North American companies to be both younger and developing more quickly. Asia Pacific companies were younger still, being set up on average in 2006.

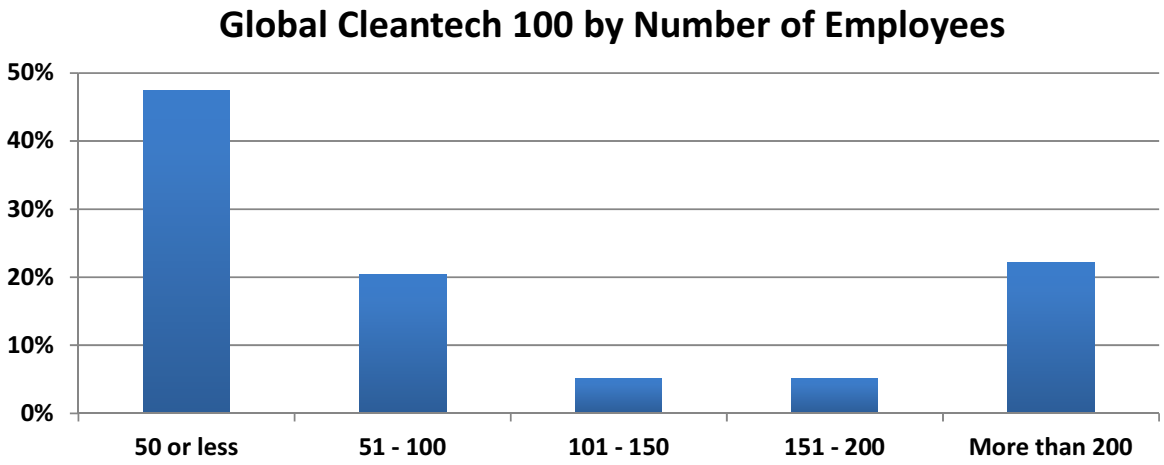


Source: Cleantech Group Analysis

What size are the 2011 Global Cleantech 100 companies?

The average number of employees across the 100 companies is 119 (up from 112 in 2010). However this varied significantly across regions, with an average of 140 for North America, 63 for Europe and Israel, and 200 for Asia Pacific. While the numbers for Asia Pacific are based on a much smaller sample, they are consistent with last year's figure (average of 213 employees) and explained by lower labor costs in comparison to the other regions.

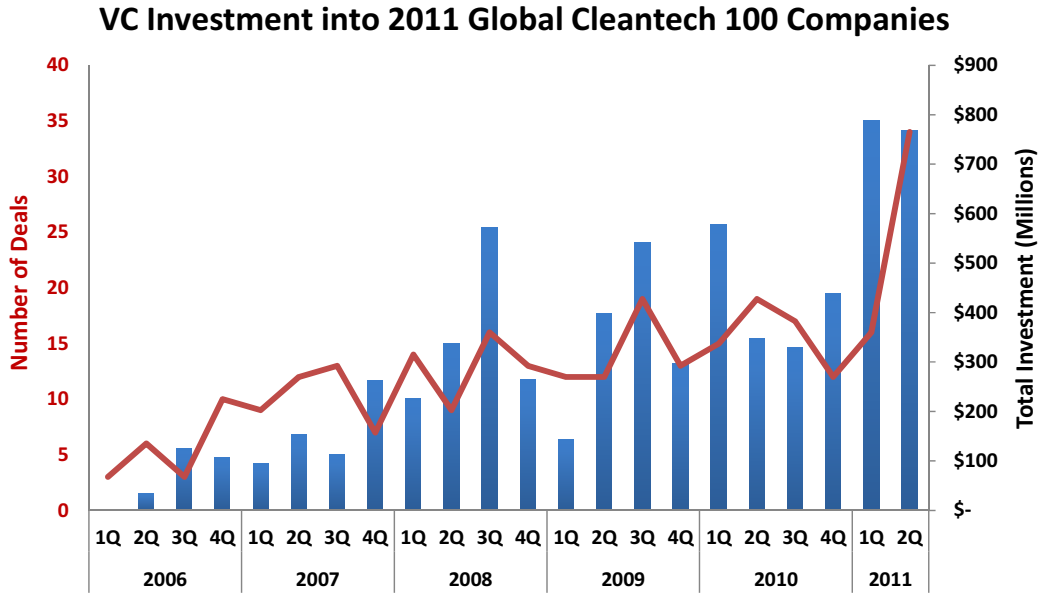
The greater company size in North America compared to Europe and Israel can be attributed, in part at least, to the financing culture. North American companies typically see larger funding rounds earlier in their development, giving more capital to grow staff and facilities, a more aggressive approach that can yield big wins but also big write-offs. Solyndra would be a case in point. Another related explanation is that North American companies take a steeper commercial trajectory. As noted above, 51% of the North American companies in the global portfolio have products that are widely commercially available compared to 31% of European and Israeli companies, meaning the former are bringing in more revenue to fund expansion. That said, this analysis is subject to a 'chicken-or-egg' critique, as access to funding is clearly a contributor to the ability of North American companies to scale generate revenue earlier.



Source: Cleantech Group Analysis

What have been the investment patterns of the 2011 Global Cleantech 100 companies?

Based on Cleantech Group data, 92 of the 2011 Global Cleantech 100 fund-raised during the last two years, in aggregate receiving over $4 Billion in venture capital investment. This represents a little more than 25% of the approximate $15 Billion total cleantech VC tracked over the same time period. These 92 companies represented just less than 10% of all the cleantech companies (982, to be precise) identified as having raised venture or growth capital during this period. These numbers suggest that, despite wider fears about scarcity of capital in these times of economic uncertainty and market volatility, money is still available to the highest quality teams developing impactful technologies with clear market propositions and routes to market.



Source: Cleantech Group Analysis

Who is backing the 2011 Global Cleantech 100 companies?

Cleantech Group data shows a total of some 371 unique investing organizations (funds, corporate, family offices, etc.) from 28 countries have made some form of investment in the 2011 Global Cleantech 100 companies. This year saw some movement between the established cleantech investors, with Kleiner Perkins Caufield & Byers (KPCB) overtaking VantagePoint Capital Partners as the investor with the most companies in the list. Environmental Technologies Fund and Generation Investment Management joined the list of top investors (5 or more investee companies in the 100), while Good Energies and Frog Capital dropped off from the 2010 list, the latter having seen two 'Global Cleantech 100 alumni exits' in the 12 months since the last Global Cleantech 100 was published.

Everything is relative. When the total size of a fund manager's cleantech portfolio is taken into account, Environmental Technologies Fund, Foundation Capital, Generation Investment Management, and VantagePoint Capital Partners do especially well, as they all have more than a third of their total qualifying portfolio companies represented in the 2011 Global Cleantech 100. Khosla Ventures is also worth a mention, for having achieved two positive exits (Amyris Biotechnologies and Gevo) from their portfolio representation in the 2010 list and for maintaining a strong presence in the 2011 list, despite the 'loss' of these two.

Investor	Total Companies	Investee companies in 2011 Global Cleantech 100
Kleiner Perkins Caufield & Byers (KPCB)	14	Agilyx, Amprius, APTwater, Enphase Energy, Fisker Automotive, GMZ Energy, Hara, Harvest Power, Kaiima, Miasole, OPower, Recyclebank, Silver Spring Networks, Transphorm
VantagePoint Capital Partners	12	1366 Technologies, Adura Technologies, Amprius, Better Place, Bridgelux, BrightSource Energy, Chemrec, Genomatica, Miasole, Ostara Nutrient Recovery Technologies, Tendril, Trilliant
Draper Fisher Jurvetson	9	Attero Recycling, BrightSource Energy, Genomatica, Kaiima, Oasys Water, SCIenergy (fka Scientific Conservation), SolarCity, SynapSense (DFJ Frontier), Synthetic Genomics
Environmental Technologies Fund	5	4Energy, Chemrec, Compact Power Motors, Kebony, Nujira
Foundation Capital	5	eMeter, Purfresh, Silver Spring Networks, SunRun, Transphorm
Generation Investment Management	5	GreenRoad Technologies, Harvest Power, Recyclebank, SolarCity, Tigo Energy
Khosla Ventures	5	LanzaTech, LS9, NanoH2O, Sakti3, Seeo

Which corporates are engaging with the Global Cleantech 100?

The increase in corporate investment activity in cleantech companies is just one aspect of a wider move sweeping boardrooms internationally. Corporations have well and truly woken up to both the risks of looming energy and resource scarcity scenarios and to the corresponding opportunity set, represented in the global ecosystem of innovative cleantech companies. Research undertaken by McKinsey & Co for the Carbon Trust in 2008 tried to quantify the potential impact of these drivers. It found that up to 65% of value could be at risk for badly positioned, laggard companies in some sectors, and that there was an up to 80% value creation

opportunity for well positioned, proactive companies in particular sectors, as a result of climate change.[2]

Further, with corporate R&D costs rising, the cleantech start-up has become an increasingly attractive source of innovation to leverage for large companies seeking to remain competitive and current with the ongoing changes.

Identifiable Activity of Corporations with 2011 Global Cleantech 100 companies

The table below lists the international corporations who we know to have engagements as a stakeholder in three or more companies on the 2011 Global Cleantech 100 list.[3] These 'engagements' could be as a customer, partner, or investor. Where there is an investment, that has been broken out separately. Clearly there are companies where there is both an equity stake and a commercial supply partnership; that is why the columns do not sum.

Corporate	# Companies Partnered with	# Companies Invested in	Total Companies 'engaged' with
General Electric	13	14	18
Siemens	10	5	11
Google	4	5	8
IBM	7		7
Intel	4	4	6
Pacific Gas & Electric (PG&E)	5		5
Coca-Cola	5	1	5
Dow Chemical	3	2	5
BP	2	3	5
Unilever	4	1	4
Waste Management	3	3	4
Southern California Edison	4		4
Itron	4		4
General Motors	4	1	4
Chevron	3	3	4
A123 Systems	4	1	4
Philips	3		3
Procter and Gamble	3		3
DSM	3	1	3
Energate	3		3
Cargill	1	2	3
Duke Energy	3	1	3

Source: Cleantech Group

[2] *Climate Change – a business revolution?* (Carbon Trust, 2008)

[3] The accuracy of this information is partly dependent on the companies disclosing such information. They were asked 'who are your top 10 customers/partners'. Not all responded. And, no doubt, some relationships are confidential, with information availability varying across different regions of the world

The 2011 Global Cleantech 100: The 'Lust' and 'Marmite' Lists

Key factors in giving this annual list credibility and rigor are the process our expert panel undergoes, and the 'Lust List' principle (that for every company anyone votes for where they have bias (typically via a shareholding), they must always provide at least two more nominations where they are not).

It also allows us to look at which companies are admired most, and why (the 'Lust List'); and which attract the strongest and the most divided opinions (the 'Marmite List').

What is it that people like or dislike about (these) cleantech companies?

Panellists were asked to identify the most promising commercial ventures, evaluated for their potential and likelihood to achieve high growth and high market impact in a 5-10 year time period. They were asked to consider the following three angles:

1. The Innovation (the problem it solves; uniqueness; sustainability of advantage, etc.)
2. The Market (accessibility, size, growth dynamics, barriers to entry, etc.)
3. The Ability to Execute (finances; team competences; connections and networks, etc.)

The 100 companies should, therefore, represent the 100 most promising ventures based on these criteria - according to weighted collective opinion. Within these broad criteria, there are different points of emphasis. We examined patterns of what industry insiders regard as of highest importance.

For companies rated highly, there were the usual factors – market leadership position, market traction, technology/product differentiation, and team quality. What was clearly noticeable this year, however, in comparing back to the last two years, was how progress on (lowering) costs was focused on more heavily. This is a clear recognition that the end market 'demands' eco-products that substitute existing products to be cost-competitive with those they replace.

The more interesting analysis turned out, once again, to be an investigation of the use of negative votes and the reasons cited when our expert panellists made cases against companies (on the short-list). For companies rated negatively, the top 5 reasons were:

Reason for Negative Vote	Citation Frequency
Technology not good enough	21%
Lack of market (too small or crowded)	21%
Timing wrong (too early or late)	16%
Products too expensive	10%
Business too capital intensive	8%

(timing comments: 15 of the 16 were 'for too early')

The key observation on the mood in 2011 surrounds the appearance of 'timing' on the above table for the first time. Year on year, it seems that the cleantech innovation community has become more and more conscious of the challenges of getting promising technologies/innovations into industrial markets, which are often dominated by large, conservative, old companies, in no hurry to change. Throwing in the capital intensity point too,

getting this timing right could make or break a company – and indeed, a fund backing such companies.

The 'Lust List': which companies today command the greatest peer admiration?

Of course, we are all proud of our own house, our own spouse, our own children, our own business, and (many of) our investment decisions. At the same time, humans are constantly comparing and secretly admiring. We can recognize beauty and merit in others, even rivals', as hard as that can be for some of us to admit publicly.

Our methodology in arriving at a final 100, forces participants (or those whose input was allowed to count) to tell us more about what they lust over which is not theirs, than about what is theirs, and it gives the expert panel the chance to make cases against, as well as for, short-listed companies. They do so blind to each others' input.

Given this, it makes it all the more interesting to look at some of the voting patterns and see who or what attracts the most agreement and disagreement.

At the top of the lust list, as measured by the companies with the most peer validations in the expert panel assessments, where no one made a negative case, were the five companies below. As such, it could reasonably be argued that these are seen as the category leaders, the cleantech players' companies of 2011.

Some of the panellists' comments are summarized and synthesized below in italics, generally in the words they used, to provide us all with insight on what people rate about them, but respecting anonymity. The words are instructive as to the mood of the market, as much as the analysis of the negative citations above.

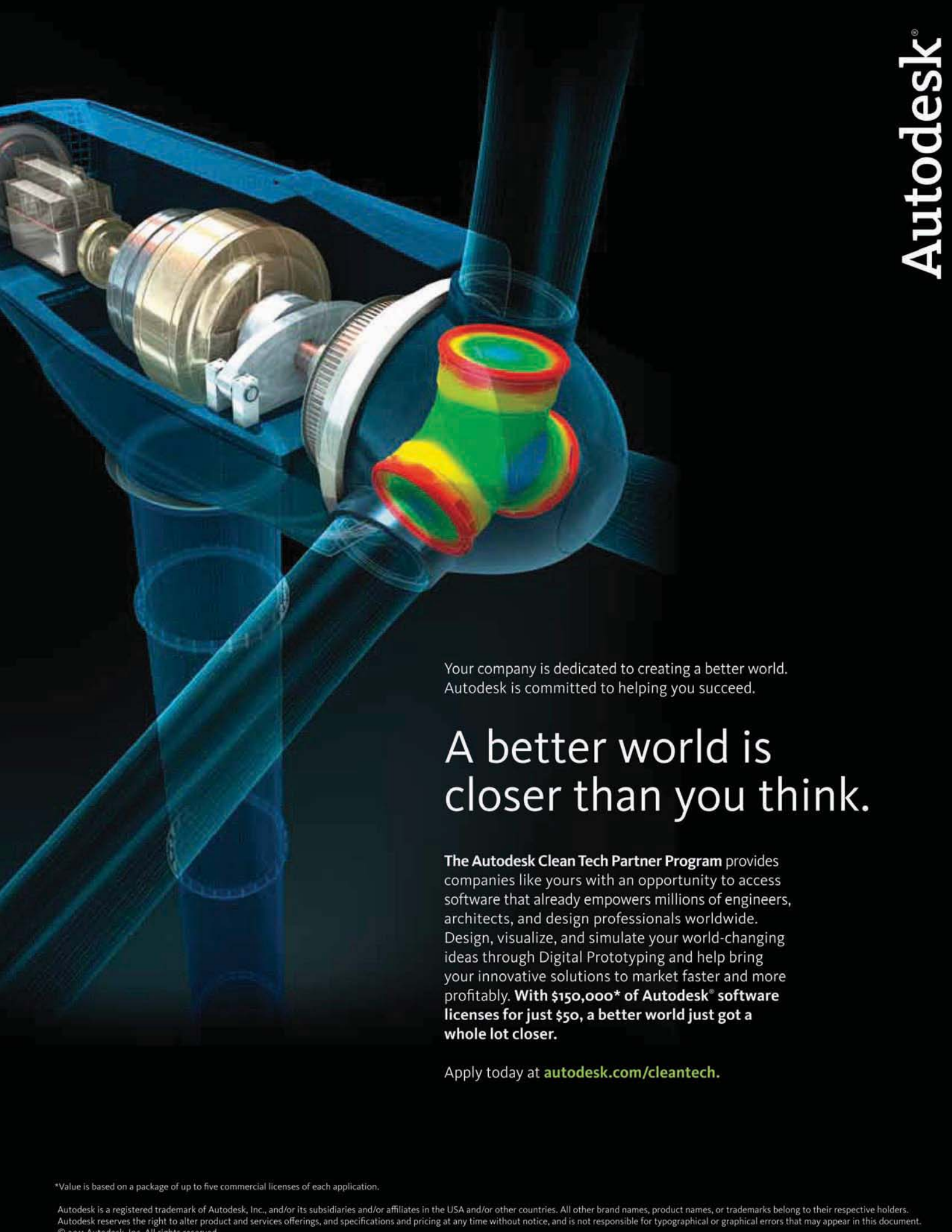
1. TaKaDu

A great value proposition, taking advantage of existing data harvested by utilities, the company is addressing key problems in a difficult industry. They have an easy to adopt SaaS business model, as well as, crucially, an easy to install product. They have strong customer traction, and good channel partner relationships, supportive investors, and a good team.

Their solution is addressing an immense need; if they execute well, there is huge potential for this type of capital-light model across the developed world.

2. Coulomb Technologies

A market leader, addressing a large future need. The company is well poised to cater to the fast growing EV charging market with a good chance to stay amongst the top of charging companies.



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3. Hara

A clear market leader in its space, one of the fastest growing companies in the EEMS space; a clear example of an IT company bringing its knowledge and expertise to the cleantech space. It is providing a service in growing demand with an impressive list of clients.

4. Silver Spring Networks

This experienced and well diversified management team assembled from utility, cable, telecommunications and information technology leaders has a significant market opportunity. It is well-financed and performing strongly in this fast growing sector. Indeed it is the sector leader and, as such, will act as a bellwether for the smart grid IPOs that follow.

5. Opower

The company has won two of the largest Smart Grid deployments in the U.S. and is on track to save one terawatt per hour by 2012. It is an impressive, award winning management team, with a good business model in a growing sector. It has considerable momentum, strong traction with utilities, and is now broadening to an international approach.

Well positioned to win and have a disruptive impact on the utility industry, time will tell if it is sustainable.

The 'Marmite List': which companies and sectors divide opinion?

The somewhat tongue in cheek 'Marmite List' is inspired by a Unilever food product, Marmite, that has famously divided tastes since being introduced to the market 100 years ago. So much so that 'You either love it or you hate it' has become part of the marketing![4]

The more serious point behind the analysis is to identify those companies which attracted the strongest split of opinions across the expert panel, a mix of positive and negative votes.

Better Place featured in the 2010 'Marmite List' but was out-done by Bloom Energy. This year, it heads the 'Marmite List' as the company which made the 2011 Global Cleantech 100 (and indeed, note, is one of 24 companies to make the list on each of the three years of its existence), but which also attracted the strongest divide of opinion, between 'lovers' (positive votes) and 'haters' (negative ones). Here is a flavour of the divide (more or less in the words of different panellists):

Better Place – the 'lovers':

Better Place will definitively be one of the big winners of the electric mobility trend. It has global outreach, an excellent management team and partnerships with key players, in both the battery and automotive industries, as well as a strong investors syndicate. It is still changing the industry on what is possible for EVs on a large country scale and they continue to prove the validity of their approach.

[4] http://www.unilever.co.uk/brands/foodbrands/marmite.aspx

Better Place – the ‘haters’:

Better Place has a controversial business model that is at risk of becoming obsolete by the time it matures. It is a niche play for as long the big automotives don't buy in

Fisker Automotive is also high up the ‘Marmite List’ for the second year running. The flavour of the divide here is as follows:

Fisker Automotive – the ‘lovers’:

With a first luxury PHEV to market, its 2nd generation sedan at the proposed price point can truly promote the sector. It has unique technologies integrated into a desirable platform, and an appealing design. With product beginning to ship, it is executing on plan

Fisker Automotive – the ‘haters’:

If it weren't for the federal loan guarantee, this would not be a company. It is way too capital intensive, producing an average car in an overly competitive market. Product release has constantly been delayed.

Distinct from the Lust and the Marmite lists, a handful of companies made the 2011 Global Cleantech 100 with relatively little comment or obvious support from within the expert panel, relying on a strong performance on the ‘votes of confidence’ we draw from our research in phase 1 of the process. We think of these as the ‘Under the expert panel radar’ companies. The three that stand out as “under the radar” are On-Ramp Wireless, Seeo, and Synthetic Genomics.

The Global Cleantech 100 Alumni: where are they now?

What happened to the 42 companies in the 2010 but not the 2011 list?

Forty-two companies from the 2010 Global Cleantech 100 did not make the cut in 2011. For some, this is because their success has led to an exit in the last 12 months since the last cut-off date (August 31st 2010) that made them ineligible for consideration. For others, there may have been setbacks, temporary for some, more permanent for others. For others, it would be less clear or definitive as to why.

The Global Cleantech 100 Alumni exits in 2010-11

The following table shows all alumni companies (companies who have been in one or both of the previous two annual lists, in 2009 and 2010) who are no longer eligible for the Global Cleantech 100 due to a change in their ownership status since August 2010. In some cases in italics below, we have drawn from, on an anonymized basis, an expert panellist's view on the exit and why, in his or her view, that particular management team had achieved the most impressive exit. 'Impressive' meant a company which had both managed to realize good returns for its investors through the exit and secured bright future prospects for the company, given the strategic progress it had made pre-exit and given its new ownership.

Company	Year in list	Event	Acquirer/Exchange
SiC Processing	2009 & 2010	Acquired	Nordic Capital
Cpower	2009 & 2010	Acquired	Constellation Energy
Amyris Biotechnologies	2009 & 2010	IPO	NASDAQ
Gevo	2009 & 2010	IPO	NASDAQ
agri.capital	2010	Acquired	Alinda Capital Partners
Zipcar	2010	IPO	NASDAQ
Inge	2009	Acquired	BASF
Landis+Gyr	2010	Acquired	Toshiba
Solazyme	2009 & 2010	IPO	NASDAQ
QuantaSol	2009	Acquired	JDSU
Solyndra	2009	Bankrupt	n/a

In place of the three solar exits remarked upon this time last year, this year has seen a spate of IPO's for biofuels companies, including for three alumni of the 2010 Global Cleantech 100:

- California-based Amyris Biotechnologies, a developer of a synthetic biology platform for the production of fuels and chemicals, raised $85 million from shares priced at $16, below the expected range of $18 to $20. Its price has been as high as $34 but, at the time of going to print (September 13) it had fallen prey to the market's sharp falls and fallen back down to $18.

"While their platform may not be as sustainable as some of the other biofuel plays, the company (Amyris) managed to create multiple strategic partnerships pre-IPO to give it market diversification, and it provided a good exit window for its investors."

- Colorado-based Gevo, a producer of biobutanol from starch-based feedstocks, offered 7.15 million shares at $15 per share, raising $107 million. Its price has been as high as $26 but, at the time of going to print (September 13) it had fallen back down to $8.

"Good and proven technology, strong value proposition (butanol is better than ethanol , ability to retrofit 1st generation plants), strong team, leverage of partners, best-practice for a VC-backed company (clear intermediary milestones for value creation + IPO)"

- California-based Solazyme, a developer of an algae based fermentation process for producing a range of biofuels and biochemicals, raised $227.2 million from an IPO priced at $18, exceeding the target of $184 million. Its price has been as high as $27 but, at the time of going to print (September 13) it had fallen back down to $11.

"Each of Amyris, Gevo and Solazyme held very successful IPOs in 2011 (and the three of them might all have been bettered by Kior on a return on investment basis). However, what Solazyme represents is a highly interesting new model of multi-tiered international partnerships across a range of products that may truly represent the future of cleantech. Getting one great partner/investor is terrific but is probably the entry point to a later M&A event. Bringing together a symbiotic family of partnerships that allows for the building of a world class stand-alone company is, however, what we all dream of doing. In that regard, for me, Solazyme stands alone among this group."

The timing of these exits, along with that of KiOR, can be directly traced back to the biofuels investment peak of 2006-2007. Each of these biofuels companies that IPO'd in the last 12 months received their Series A funding during that period of unprecedented VC activity.

Outside of biofuels there was one other IPO from the 2010 Global Cleantech 100 alumni:

- Massachusetts-based Zipcar, an auto-sharing company, made its stock market debut with the price of $18 per share, well above the previously estimated range of $14 to $16. As a result, Zipcar's 9.68 million shares raised $174.24 million, far above the company's original estimates of a $75 million raise. Its price has been as high as $31 but, at the time of going to print (September 13) it had fallen back down to $19.

"Successful IPO in April reduced debt in the face of a challenging economic period. Great job of differentiation and market positioning. Effective growth in revenue (34%), membership (29%), revenue from existing markets (25%) and income (37%). Advances in user interfaces, including new Android app as well as expanded cities have them well positioned for continued growth"

There were also a number of M&A's involving Global Cleantech 100 alumni, most notably including:

- German inge Watertechnologies, a developer of ultra-filtration membranes for water treatment applications, was acquired by BASF in an important exit for cleantech's water sub-sector.

"inge was an exit that received broad attention and brought its investors a good return. The inge board and management team did a great job running the M&A process and identifying suitable acquirers for the company. Also, in its new ownership structure, inge now has outstanding

growth opportunities and can build on synergies with BASF that it could not have realized under the previous ownership."

- Swiss electronic-metering company Landis+Gyr was acquired by Toshiba for $2.3 billion, signalling a strong play by the Japanese multinational to enter the smart grid market. The deal was Toshiba's largest in five years and was made, it is believed, in the face of competition from GE, ABB, Siemens and Honeywell, as well as interest from financial (private equity) buyers.

"The company was able to achieve an exit that was attractive for investors, as well as provide positive momentum for the company going forward. In addition to the strong returns for investors, the investment was notable as it was a rather large acquisition, which can be challenging to pull off in today's market, and the acquirer, Toshiba, brings a lot of strategic value to the company and enables it to continue growing their business. Through acquiring Landis a serious global competitor to the main leading meter providers has been created (namely Siemens), something that is necessary for smart metering to become an international success."

The investors to have profited from more than one of these exits were, in the biofuels area, Khosla Ventures (Amyris Biotechnologies and Gevo), Total Energy Ventures (also Amyris Biotechnologies and Gevo) and Virgin Green Fund (Gevo and Solazyme). Elsewhere, Frog Capital's two exits (SiC Processing and agri.captial) both achieved solid multiple returns, as these two companies were acquired by Private Equity Firms, Nordic Capital and Alinda Capital Partners respectively, funds with deeper pockets to take these companies through their next expansion stage.

In last year's report it was Imara. In 2011 it is Solyndra, both alumni from the 2009 list. Much has been written already in the two weeks since the company announced it was winding up. Much will be written in the weeks and months to come no doubt, as investigations into financial propriety are conducted. We won't add to it here other than to refer back to the comment in last year's report where we wished the new CEO well in his "big turnaround challenge, for the greater good of cleantech investment's reputation". This is a high profile failure for cleantech, given the $1bn it raised in equity capital and the $535m D.O.E loan facility. And it is as stark a statement as any you could imagine of how the cost-competitiveness of the Chinese manufacturers equals market power in the solar PV industry.

The 2010 Global Cleantech 100 Alumni: "we'll be back"?

Companies from the 2010 list which were still eligible but did not make the cut for the 2011 list are shown below. Companies highlighted in red were featured in both 2009 and 2010.

AlertMe	Deeya Energy	Petra Solar
Amonix	Enerkem	Potter Drilling
Aquamarine Power	ExoSect	PowerSense
AquaSpy	Grid Net	Prudent Energy
Bloom Energy	Ice Energy	ReVolt Technology
Calera	Joule Unlimited	Sapphire Energy
CaliSolar	MBA Polymers	Serious Energy
CellEra	Metalysis	Simbol Materials
ChapDrive	Nexeon	SolarCentury
Coskata	NovaLED	Universtar
d.light design	PassivSystems	Virent Energy Systems
Danfoss AquaZ		

Some of these omissions might surprise some readers. There are some well-known old favourites here.

For example, Bloom Energy, which headed the 'Marmite List' last year. It still has big fans out there, strong believers, but with Bloom and others from the pre-2005 class there is evidence of a weariness, of a growth in scepticism as to whether they will ever deliver on the promise (or the hype, as some would see it).

Bloom Energy's fans see "good technology with suitable cost position and strong partners, with potential for applications in several industries." The naysayers believe it "has not progressed significantly given the funding raised. More hype than anything else: the emperor has no clothes?"

In Serious Energy's case, the supporters talk about sizable markets and strong value propositions, and "the array of approaches in the Serious portfolio for energy efficiency in materials for buildings", which "allow it to stand out from competition in this field". The detractors talk about the company being "way over-positioned, and over-shadowed by legals", with scepticism expressed by some "about their ability to remake themselves as a building energy efficiency company" and comments about this being "Version 3 or 4 of this company", having "destroyed a ton of shareholder equity" along the way.

Further afield, Prudent Energy, a high-profile Chinese company, has slipped off the 100. One side sees the company's offering as a "key component of large scale solar/wind farms" given its grid-scale energy storage technology makes it "amongst the most advanced companies in the world". The other point of view worries about "major cost problems because of the use of Vanadium" and "too many changes of business model"

Private, illiquid markets are far from efficient, in as much as information asymmetries certainly exist. This gives rise to wide diversity of opinions on particular sub-sectors and particular companies. This is very apparent in the process we go through to arrive at an annual Global Cleantech 100. The methodology favours companies where there is the strongest sense of consensus on companies' with the hottest prospects and can mean some fine companies, some companies that will ultimately end up as 'winners', may not feature on the list, this year or ever.

Concluding Remarks

What should we expect of these 100 companies in the next year? What do we expect more generally for the global population of cleantech companies?

Signs are that capital will remain tight, and markets jittery. Fundraising patterns of the last two years means that there is less capital available within venture capital in Europe and North America. There have been very few new funds closed in that time period. This means company management teams will need to be looking in different geographies, courting strategic corporates and family offices and high net worth individuals to compensate, if they are to continue to raise funds at the same rate as they have become accustomed to.

That is not necessarily the case for Asia, especially China, given the number of funds which have been successfully raised in the region over the last three years. That said, it can be hard to find deals in China at the right valuation; some told us on our most recent trip there of private equity firms who had not done a deal for three years because of 'hot' money driving prices upwards.

The other part to keep an eye on will be those companies who already filed for IPO's in the spring-time, before the market falls of summer 2011. Within the 2011 Global Cleantech 100 that includes BrightSource Energy, Enphase Energy, Genomatica, and Silver Spring Networks, with Luca Technologies and Mascoma from previous years too, the latter the most recent filing. How these fare after Solyndra and the sharp market falls during summer 2011, will be an interesting test for cleantech innovation as an investment theme, as we head for 2012.

Appendix 1: The Expert Panel

Name	Title	Organization
Girish Nadkarni	Managing Director	**ABB Technology Ventures**
Andre Loesekrug-Pietri	Founder & Managing Partner	**A Capital**
Jean-Pascal Tranie	President	**Aloe Private Equity**
Cédric Latessa	Investment Manager	**Aster Capital**
Bernhard Mohr	Investment Manager	**BASF Venture Capital GmbH**
John Steedman	Director Venturing	**BP Alternative Energy**
Paul Decraemer	Head Cleantech Investment Practice	**Capricorn Venture Partners**
Adam Workman	Partner	**CT Investment Partners**
Saul Reichman	Principal	**The Challenge Fund**
Wal van Lierop	President & CEO	**Chrysalix Energy Venture Capital**
David Cheng	Director, Research & Advisory	**Cleantech Group**
Josh Gould	Director, Research & Advisory	**Cleantech Group**
Vince Knowles	Research Analyst	**Cleantech Group**
Greg Neichin	VP, Research & Advisory	**Cleantech Group**
Richard Youngman	MD, Europe and Asia	**Cleantech Group**
Peter Kennedy	Managing Director	**CLSA Capital Partners**
Cees van Dongen	Director, Strategic Planning E&WR	**Coca Cola**
Wayne Keast	CEO New Energy and Environment Investments	**Consensus Business Group**
Olivier Dupont	Chairman of the Board	**Demeter Partners**
Mary-Kay James	Managing Director	**DuPont Ventures**
Srini Somayajula	Director, Global Technology Alliances	**Ecolab**
Alex McIntosh	CEO	**Ecomundi Ventures**
Antoine Aslanides	Innovation Director	**EDF**
Whitney Rockley	Partner	**Emerald Technology Ventures**
Wally Hunter	Managing Director	**EnerTech Capital**
Sylvia Chan	Managing Partner	**Entropy Ventures**
Adam Pool	CEO	**Environmental Investment Partners**
Henrik Olsen	Managing Partner	**Environmental Technologies Fund**
Iyad Omari	Partner	**Frog Capital**
Jeffrey Fulgham	Chief Sustainability Officer	**GE Power & Water**
Colin Le Duc	Partner	**Generation Investment Management**
Nicholas Atkins	Partner	**Georgieff Capital**
Jon Lauckner	Corporate Strategy and Business Development	**GM**
Thorbjorn Machholm	Director, Business Development	**Grundfos**
Diego Diaz Pilas	Technical Co-ordinator	**Iberdrola**
Nicolas Chaudron	Partner	**Idinvest Partners**
Nikunj Jinsi	Head & Chief Investment Officer, Climate Business Group – Clean Technology Investments	**IFC**

Stephen Eichenlaub	Managing Director, Emerging Platform Technologies and Cleantech Sector	**Intel Capital**
Glen Schwaber	Partner	**Israel Cleantech Ventures**
Joe McGee	Executive Vice President, Strategic Planning and Development	**Jabil**
Joe Zhou	Managing Partner	**Keytone Ventures**
Assaf Barnea	CEO	**Kinrot Ventures**
John Denniston	Partner	**Kleiner Perkins Caufield & Byers**
Krish Krishnamurthy	Head of Clean Energy Technology – North America and CCS	**Linde**
Rick Fratus	Senior Vice President	**Macquarie Funds Group**
Ravi Viswanathan	Partner	**New Enterprise Associates**
Rodrigo Prudencio	Partner	**Nth Power**
Himraj Dang	Director of Environmental Investments	**Olympus Capital**
Steve Meller	Chief Innovation Catalyst	**Procter and Gamble**
Dhiraj Malkani	Principal	**Rockport Capital Partners**
Crispin Leick	Executive Director	**RWE Innogy GmbH**
Rhea Hamilton	Senior Investment Manager	**SAM Private Equity**
Ji-Yeong Kang	Managing Director	**Samho Green VC**
Vicky Sharpe	President & CEO	**SDTC**
Mike Goguen	Partner	**Sequoia Capital**
Michael Majors	Investment Partner	**Siemens Venture Capital**
Arlin Wasserman	VP of Sustainability & CSR	**Sodexo**
Thorsten Reuter	Growth Ventures & Innovation	**Sony**
Ignacio Martinez	Principal	**Syngenta Venture Capital**
Avinash Patkar	Chief Sustainability Officer	**Tata Power**
Astorre Modena	Partner	**Terra Venture Partners**
Don Ye	Founder & Managing Partner	**Tsing Capital**
Bjarne Henning Jensen	Partner	**Vaekstfonden**
Stephan Dolezalek	Managing Director and Group Leader, CleanTech	**VantagePoint Capital Partners**
William Wescott	Vice President of Innovation, Americas	**Veolia Environnement**
Rohit Gupta	Manager, Business Development	**Vestas**
Bart Markus	General Partner	**Wellington Partners**
James McNaught-Davis	Managing Partner	**Wheb Ventures**
Khalil Maalouf	Partner	**XPV Capital**
Felix von Schubert	Partner	**Zouk Capital**

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Appendix 2: The 2011 Global Cleantech 100 companies – mini-profiles

Below are mini-profiles for the 100 companies on our list. More extensive profiles on these and hundreds of other cleantech companies are available online on the Cleantech Group's i[3] platform. See http://i3.cleantech.com/ for more.

Company	Country	Primary Tag	Summary
1366 Technologies	USA	Solar	Developer of manufacturing technology that reduces costs and increases the efficiency of silicon wafer production for solar cells.
24M Technologies	USA	Energy Storage	A spinout of lithium-ion battery maker A123 Systems experimenting with advanced lithium ion and flow battery designs for grid-scale and EV applications.
4Energy	UK	Energy Efficiency	Developer of cooling devices for thermally sensitive equipment such as radios, routers, batteries, and data centers.
Adura Technologies	USA	Energy Efficiency	Developer of lighting management systems based on low-power wireless mesh networking systems.
Agilyx	USA	Recycling & Waste	Provider of a technology that converts mixed waste plastics into synthetic crude oil and other valuable petrochemical products.
Amantys	UK	Smart Grid	Commercializing a digital power switching platform to address power losses.
AMEE	UK	Energy Efficiency	Developer of a reference platform to measure and track carbon, greenhouse gas and energy impacts.
Amminex	Denmark	Air & Environment	Developer of chemical-based ammonia storage and delivery systems for removing NOx from diesel emissions, and storing hydrogen for fuel cell applications.
Amprius	USA	Energy Storage	Developer of advanced lithium-ion batteries for consumer electronics and automotive applications.
APTwater	USA	Water & Wastewater	Develops proprietary water treatment technologies and provides operating services, targeting a wide variety of contaminants and applications in industrial and municipal water and wastewater.
Aqwise	Israel	Water & Wastewater	Developer of a fixed biofilm water and wastewater treatment process for municipal and industrial markets.
Attero Recycling	India	Recycling & Waste	Provider of e-waste management and recycling services.
Avantium	Netherlands	Materials	Developer of a technology that converts biomass into bio-based polymers called Furanics.
Barefoot Power	Australia	Solar	Developer of solar powered lighting products for use in developing countries.
Better Place	USA	Transportation	Provides charging infrastructure and services for electric vehicles.
BioAmber	USA	Biofuels & Biomaterials	Developer and producer of green chemicals from agricultural feedstocks with a focus on bio-based succinic acid.
Boston-Power	USA	Energy Storage	Producer of lithium-ion battery technology for the portable power, electric vehicle and utility energy storage markets.
Bridgelux	USA	Energy Efficiency	Developer of energy efficient LED lighting systems.
BrightSource Energy	USA	Solar	Designs, develops and sells solar thermal power systems for utility and industrial companies.

Canatu	Finland	Materials	Developer and manufacturer of thin film component and carbon nano-materials.
Chemrec	Sweden	Biofuels & Biomaterials	Developer of energy and chemical recovery systems that convert papermaking by-products into biofuels via gasification technology.
ClimateWell	Sweden	Energy Efficiency	Provider of indoor climate equipment that stores available thermal energy for desired use.
Compact Power Motors	Germany	Transportation	Developer of ultra-compact electric motors.
Coulomb Technologies	USA	Transportation	Developer of networked charging stations for electric vehicles.
Digital Lumens	USA	Energy Efficiency	Developer of LED-based Intelligent Lighting Systems for commercial and industrial building spaces.
Electrawinds	Belgium	Other	Provider of renewable energy from wind, solar and biomass.
Elevance Renewable Sciences	USA	Materials	Producer of high-performance waxes, functional oils, anti-microbials, lubricants, additives and other chemicals using olefin metathesis technology.
Emefcy	Israel	Water & Wastewater	Developer of Electrogenic Bioreactors (EBR) that treat wastewater and generate electricity.
eMeter	USA	Smart Grid	Developer of a software platform and applications that allow electric, gas, and water utilities to execute large-scale smart grid deployments.
Enecsys	UK	Solar	Developer of micro-inverters for solar PV systems.
EnOcean	Germany	Energy Efficiency	Developer of energy harvesting sensors and communication systems for use in building automation and energy management systems.
Enphase Energy	USA	Solar	Provider of solar energy management systems, for residential and commercial markets to make solar PV installations more efficient and responsive.
eSolar	USA	Solar	Developer of modular heliostats and tower-mounted receivers for utility-scale solar thermal energy generation.
EVO Electric	UK	Transportation	Developer of electrical motors, generators, gensets, and integrated hybrid electric drivetrain systems based on proprietary axial flux motor/generator technology.
FilterBoxx	Canada	Water & Wastewater	Supplier of containerized water treatment systems to industrial, municipal, resort and aboriginal clients.
Fisker Automotive	USA	Transportation	Developer of plug-in hybrid and solar powered luxury automobiles.
General Compression	USA	Energy Storage	Developer of isothermal compressed air energy storage systems to provide fuel-free energy storage for renewable energy generation.
Genomatica	USA	Materials	Developer of green chemicals from renewable feedstocks such as sugar and trash.
GMZ Energy	USA	Recycling & Waste	Developer of thermoelectric nano-materials to convert waste heat into energy.
Green Biologics	UK	Biofuels & Biomaterials	Developer of microbial, fermentation and process technology to turn readily available waste and agricultural by-products into high value chemicals and fuels.
GreenRoad Technologies	USA	Transportation	Provider of software, hardware and change management solutions to optimize driving behavior from a safety, fuel efficiency, and vehicle stress point of view.

Hara	USA	Energy Efficiency	Provides a cloud-based solution to measure, monitor and optimize enterprise resources and waste outputs such as energy, water, waste and carbon.
Harvest Power	USA	Recycling & Waste	Produces energy sources and fertilizer products from waste plants.
Heliatek	Germany	Solar	Developer and producer of organic photovoltaic solar cells.
Helveta	UK	Agriculture	Provider of sustainable forestry management technology.
HydroPoint Data Systems	USA	Water & Wastewater	Provider of satellite-based smart irrigation technologies.
Ioxus	USA	Energy Storage	Developer of ultra-capacitors and hybrid-capacitors that can be made into individual cells, pre-packaged modules, or complete systems.
JouleX	USA	Energy Efficiency	Produces software programs that manage energy usage in the IT networks of offices and data centers.
Kaiima	Israel	Agriculture	Developer of genomic-based breeding technology to develop high-yielding energy crops for bio-diesel, bio-ethanol, and biomass energy. Formerly Biofuel International.
Kebony	Norway	Materials	Manufacturer of sustainable hard wood created by modifying sustainably sourced soft wood.
LanzaTech	New Zealand	Biofuels & Biomaterials	Developer of a process that increases industrial energy efficiency by capturing waste gases (CO, CO2) and converting them to fuels and chemicals.
LatticePower	China	Energy Efficiency	Developer of high-output white LEDs based on gallium nitride (GaN) die fabricated on silicon substrates.
Lemnis Lighting	Netherlands	Energy Efficiency	Developer of sustainable lighting solutions based on LEDs.
LS9	USA	Biofuels & Biomaterials	Developer of genetically modified microbes, converting feedstock into renewable fuels and chemicals in a one-stage fermentation process.
McPhy Energy	France	Energy Storage	Developer and producer of solid state hydrogen storage batteries for renewable energy and industrial gas storage.
MiaSolé	USA	Solar	Developer of copper indium gallium selenide (CIGS) thin-film photovoltaic solar panels.
Mission Motors	USA	Transportation	Manufactures electric motorcycles, and develops and supplies powertrain technology to automotive OEMs. Formerly known as Hum Cycles.
NanoH2O	USA	Water & Wastewater	Develops nano-composite membranes for the desalination market.
Nexant	USA	Energy Efficiency	Provider of intelligent grid software and clean energy solutions.
Nexterra	Canada	Biofuels & Biomaterials	Develops, manufactures and delivers gasification systems to self-generate clean, low cost heat and power at industrial and institutional facilities using waste fuels.
Nobao Renewable Energy Holdings	China	Other	Developer of heating and cooling geothermal technologies through energy management contract (EMC).
Novacem	UK	Energy Efficiency	Develops carbon negative cement.
Novomer	USA	Materials	Producer of polymers and plastics made from CO2 and other renewable materials.

Nujira	UK	Energy Efficiency	Provider of high efficiency radio frequency and power amplifiers for the wireless communications industry.
Oasys Water	USA	Water & Wastewater	Developer of a forward osmosis platform for desalination, water treatment, and waste heat recovery.
O-Flexx Technologies	Germany	Other	Developer of thermo-electric products that convert heat into electricity.
On-Ramp Wireless	USA	Smart Grid	Developer of wireless communication systems for the water, smart grid and other industries that allow device communication in hard to reach environments.
Opower	USA	Smart Grid	Software-as-a-Service developer of customer engagement and billing analytics tools for utilities.
Ostara Nutrient Recovery Technologies	Canada	Water & Wastewater	Sells fertilizer it removes and collects from municipality water waste.
Project Frog	USA	Energy Efficiency	Designer and manufacturer of energy and resource efficient and zero net energy modular buildings.
Puralytics	USA	Water & Wastewater	Developer of photochemical water purification technology.
Purfresh	USA	Agriculture	Developer of ozone technology to provide safe, fresh, high quality produce and water.
Recupyl	France	Recycling & Waste	Developer of hazardous waste recycling technologies transforming waste into valuable materials.
Recyclebank	USA	Recycling & Waste	Developer of a financial rewards system for households that recycle.
RelayRides	USA	Transportation	Developer of a peer-to-peer car sharing platform that connects car owners willing to rent their cars that are not in use, with drivers who need short-term vehicle access.
Sakti3	USA	Energy Storage	Developer of advanced solid state lithium ion battery technology, aimed at the electric vehicle market.
SClenergy (fka Scientific Conservation)	USA	Energy Efficiency	Provider of a cloud-based solution for commercial buildings to manage energy use by comparing predicted energy and system efficiencies with real-time operations.
Seeo	USA	Energy Storage	Developer of advanced solid-state batteries to revolutionize electricity storage and delivery.
ShineOn	China	Energy Efficiency	Involved in the research, development and production of high brightness LED devices.
Silver Spring Networks	USA	Smart Grid	Provider of networking communication technologies and solutions to utilities for advanced metering, as well as home energy management, distribution automation, and other related applications.
Solairedirect	France	Solar	Developer of solar PV installations for residential, commercial and community-scale customers.
SolarCity	USA	Solar	Provider of design, financing and maintenance services for solar power customers.
Soltecture	Germany	Solar	Producer of CIGS/CIGSe thin-film photovoltaics. Formerly known as Sulfurcell.
Stirling DK	Denmark	Biofuels & Biomaterials	Operator of a CO2 neutral combined heat and power plant based on a biomass-fired Stirling Engine.
Suniva	USA	Solar	Manufactures high-efficiency crystalline silicon solar cells and high-power solar modules.
SunRun	USA	Solar	Purchases, installs and maintains residential solar energy systems, removing the high upfront capital requirement.
SustainX	USA	Energy Storage	Developer of energy storage technologies in the form of compressed air.

SynapSense	USA	Energy Efficiency	Provider of wireless instrumentation and control systems for energy and thermal efficiency in data centers, clean rooms, and facilities.
Synthetic Genomics	USA	Materials	Developer of genome-based solutions for biofuels and biochemicals.
TaKaDu	Israel	Water & Wastewater	Provides a web-based Water Infrastructure Monitoring platform that enables utilities to conserve water, energy and infrastructure.
Tendril	USA	Energy Efficiency	Provides a home energy management SaaS platform that facilitates interaction within the energy ecosystem and provides utility solutions.
Tigo Energy	USA	Solar	Provider of hardware, software and web-based applications to improve PV installation power output.
Topell Energy	Netherlands	Biofuels & Biomaterials	Manufacturer of torrefied pellets from a variety of biomass feedstocks.
Transphorm	USA	Energy Efficiency	Develops technology to eliminate the electric conversion losses when converting from alternating to direct current.
Trilliant	USA	Smart Grid	Provides unified Smart Grid communications solutions that enable advanced metering, distribution automation, demand response, Smart Home and Buildings, and integration of distributed energy resources (such as solar panels, electric vehicles etc,).
Voltea	Netherlands	Water & Wastewater	Developer of a scalable water desalination technology using membrane capacitive deionization (CapDI).
WaterHealth	USA	Water & Wastewater	Provides water purification and disinfection technology to underserved rural and peri-urban communities in developing countries.
Windlab Systems	Australia	Wind	Developer of wind farms, using proprietary atmospheric modelling software, to identify suitable regions and conduct detailed site assessment.
Xtreme Power	USA	Energy Storage	Developer of utility-scale power management and energy storage systems.
ZeaChem	USA	Biofuels & Biomaterials	Developer of a cellulose-based biorefinery platform capable of producing advanced ethanol, fuels and chemicals.

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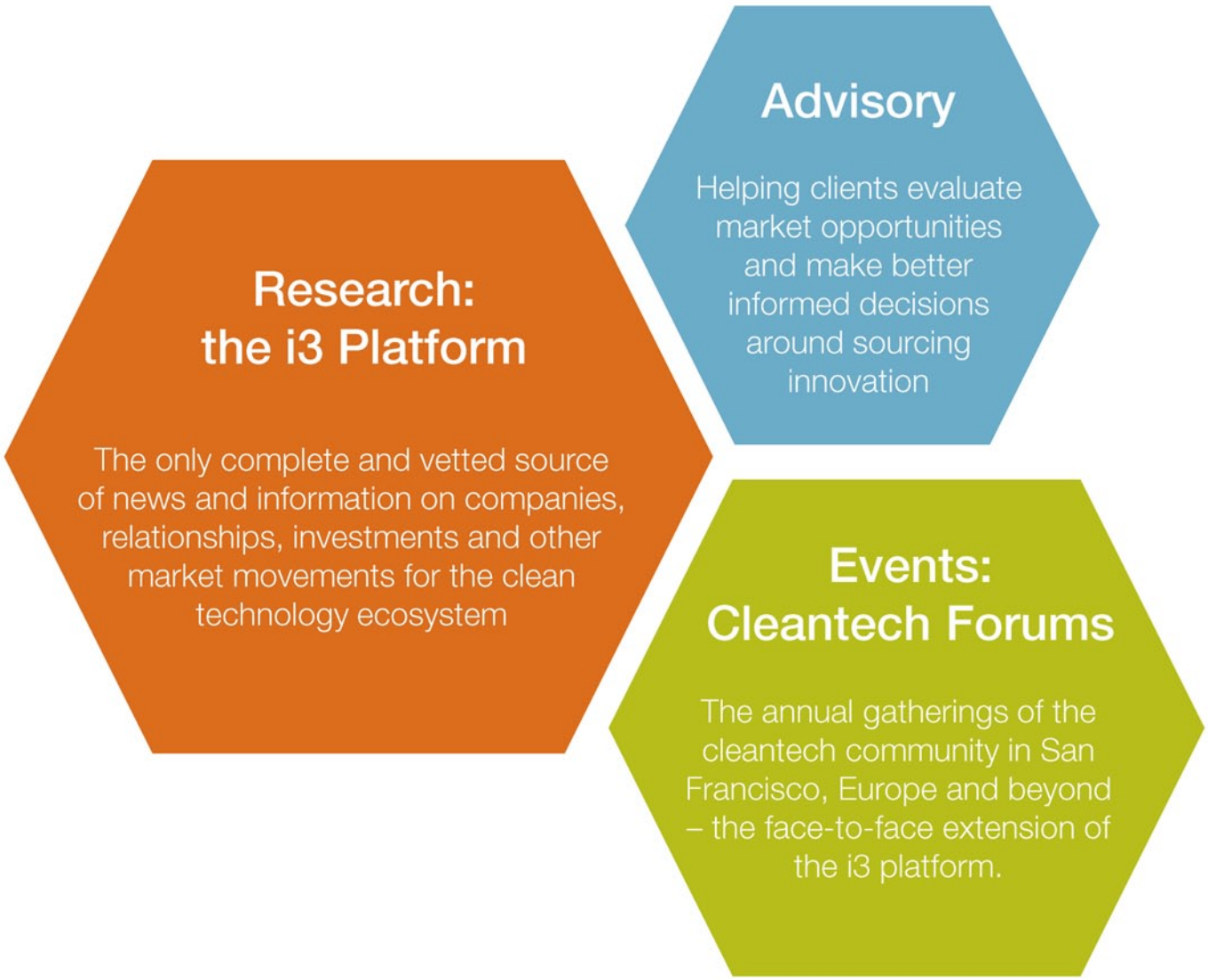

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