



ON MATTERS THAT MATTER

Impact Investing: Trading Up, Not Trading Off

October 2014



An Occasional Essay on Matters that Matter

Impact Investing in Environmental Markets: Trading Up, Not Trading Off¹

As private equity investors in selected environmental markets in the United States and Canada, NewWorld Capital Group publishes occasional essays on matters that matter in our investment strategy. We seek to present an analysis of the forces at work that are shaping investment opportunities and risks in our target markets and in the broader environmental opportunities sector.

Impact Investing has an essential role to play in drawing needed capital into solutions for some of the thorniest problems that confront our society. However, in the view of the authors, this emergent investment constituency needs a more effective approach to targeting impact opportunities and massing sufficient capital and management effort behind common themes and goals to make a meaningful difference with respect to certain vexing societal problems. This essay focuses on the environmental challenges and resource management issues that increasingly endanger the U.S. economy and, ultimately, our world community. The central idea is that impact investing should be subject to the same rigor in diligence as return-oriented investing.

By *Impact Investing* the authors mean investing both for profit *and* to address environmental or other societal needs that might otherwise not be met, applying a financially rigorous mindset with benchmarks and outcome measures to monetary performance and to achieving environmental and/or other societal objectives. The authors recognize that many Impact Investors are comfortable with concessionary returns but they believe that this style of investing is unlikely to marshal sufficient capital to generate impact at scale on the difficult environmental problems in question, nor is it likely to draw in additional capital from sources that seek market-based returns. Environmental businesses tend to be capital-intensive and take time to develop to full scale, so small investment solutions are usually not effective.

Impact Investing is a relatively young field still in formation and, in the authors' view, is in need of clearer conceptual definition, development of broadly applied "best practices" and meaningful impact measures, and the creation of a larger cadre of practitioners who understand the

¹ Although this memorandum addresses the challenge of investing to do well while doing good, commonly known as "Impact Investing," the authors wish to stress that NewWorld Capital Group, LLC is a Single Bottom Line Investor seeking top-tier economic returns. The Firm will not compromise economic returns to achieve societal benefits and, for reasons explained in the memorandum, sees no reason to do so. Myriad investment opportunities exist to produce uncompromised top-tier economic returns while also gaining other societal benefits such as reduced energy or water use, reduced air, water or land pollution, or other ways of promoting the transition to a cleaner, more sustainable economy.

requirements for success and how to bring additional like-minded investors into impact-oriented investment coalitions.²

To date, impact investing appears to have largely been led by fragmented available capital sources from investors with varying degrees of understanding regarding how impact can best be achieved in specific situations. Most such investors have carved out a limited portion of their investment portfolio to invest in what amounts to philanthropic investing. These small, uncoordinated efforts seldom have lasting impact on the difficult, systemic nature of the environmental and other societal problems our society is confronting.

In particular, what is commonly called *cleantech* investing has produced many outcome disappointments as often the business in question must first survive product technology risk and then successfully confront the challenge of business scaling (including acceptance by downstream marketing, distribution and service channels) in order to compete successfully in a market typically dominated by large, traditional players that often have subsidy or regulatory advantages over new market entrants. Cleantech investing, like most technology start-up investing, has not proven to be a successful investing mode for many participants, at least in recent years. This is not to argue against any cleantech investing, but simply to place it in the broader context of the full range of Impact Investing possibilities.

This memorandum is addressed to impact-oriented high net worth individuals and family offices, as well as foundations that seek to align their endowment investments more closely with their charitable mission, that are committed to moving our nation toward a clean economy. The central question we address is: What can concerned Impact Investors do to facilitate the transition of the United States toward a clean economy?

The term, *clean economy*, is used to represent a large body of business opportunities and practices that can result in a more resource-efficient, less wasteful and less-polluting U.S. economy—one harmonized with a vision for a clean environment and improved citizen health and wellbeing. An important addendum to this idea is that the investor should be seeking a *sustainable* improvement in the societal benefit, in order to minimize the prospect of subsequent backsliding to historical “dirty” environmental practices.³

The authors believe that impact-oriented clean economy investing can and should be attractive to investors who seek top-tier risk-adjusted economic returns. As an economy, the United States is highly inefficient in its use of resources, which suggests an opportunity for extra-normal investment returns as resources become increasingly scarce and are priced more on scarcity value, thus opening up resource efficiency and resource substitution opportunities. Many such investment opportunities are simply based on major cost savings available to industry or consumers by substituting lower-cost approaches for more costly traditional approaches, which should be a simple sell to the end customer. The clean economy market is waiting.

The environmental opportunities business sector in the U.S. is attractive for investment: It is large (approaching \$350 billion in annual turnover) and growing a 2x to 4x normalized GDP

² “Impact Investing” was named in 2007 by Antony Bugg-Levine, who conceived, developed and led the Rockefeller Foundation’s landmark initiative, Harnessing the Power of Impact Investing.

³ “Sustainability” is defined as the capacity to endure. With respect to organizational practices in continuing to pursue specific societal co-benefits, a company must focus on and generate a deep commitment in its corporate culture and management practices to stay the course—for example, companies built from their beginning around the single idea of generating attractive returns through the production and sale of certain clean economy products.

growth (with some segments growing at 15% CAGR or faster), placing it among the fastest growing sectors in the economy. Owing to its relative youth, the sector is highly innovative, thus leading to lower levels of competitive intensity, and is undercapitalized, thus typically pricing an equity dollar higher. The sector is also less cyclical as its products sell into highly diversified end markets. Finally, it is complex with technology development, regulation and the dynamics associated with early markets, thus making it an investment arena for the specialized investor. The authors believe that attractive low-correlation returns can be earned in the U.S. clean economy sector.

I. Framing the Problem

A. The Environment and Resource Efficiency

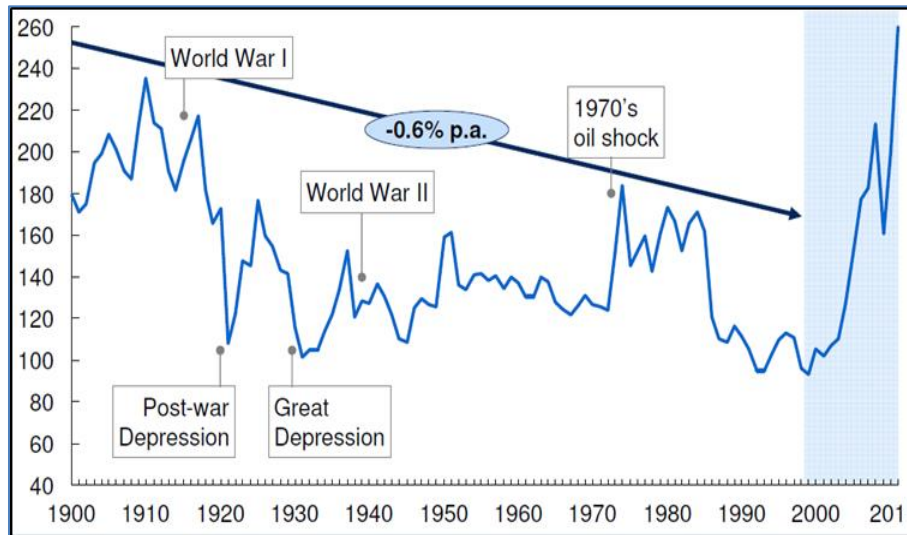
The clean economy problem is one of inefficient resource use and a polluting, “dirty” economy based largely on traditional industrial practices and resultant limited product and service choices available to the end customer. Growing resource scarcity illustrates a relatively new but very troubling problem facing our society, while the need to solve environmental problems of human health and safety has never been more acute.

The trends are ominous. Science tells us that the earth is already well beyond its carrying capacity—as much 20% to 30% beyond it—and is rapidly moving toward a non-sustainable future. Inefficient use of resources is the way of business in America. Business has grown up in a land of plentiful, low-cost resources often supported by large government subsidies and other factors that have motivated profligate resource use by industry and its customers.

For the entire Twentieth Century, the real price of a basket of basic commodities drifted lower by approximately 1.2% per year. As a consequence, there was little incentive to deploy resources more productively or to plan for resource substitution. However, since 2000, rapid commodity price increases, driven in part by emerging market demand as well as concerns over continued availability of long-term supply, have wiped out the entire price declines of the past century. Average non-oil commodity prices grew .5% per year (CAGR) between 1994 and 2010 and crude oil prices grew 2.8% per year (CAGR) between 1962 and 2010.⁴ This demonstrates a secular shift in commodity pricing as demand grows and resources become scarcer and more preciously priced. It appears that the U.S. is rapidly approaching a new epoch of resource scarcity, resource re-pricing, and a consequent urgent search for resource productivity and resource substitution.

⁴ Bilge Erten and José Antonio Ocampo, “Super-cycles of Commodity Prices Since the Mid-Nineteenth Century,” DESA Working Paper No. 110, United Nations Department of Economic and Social Affairs, February 2012.

Figure 2: McKinsey Commodity Price Indices, 1900-2011 (1999-2001=100)



Source: McKinsey & Company, based on Grilli and Yang; Pfaffenzeller; World Bank; International Monetary Fund (IMF); Organization for Economic Co-operation and Development (OECD) statistics; United Nations Food and Agriculture Organization (FAO); United Nations Commodity Trade Statistics Database (UN Comtrade); United Nations Conference on Trade and Development (UNCTAD); World Bank commodity price data; McKinsey Global Institute analysis.

Action now to move toward a clean economy will surely cost far less than action later, when the problems have reached even larger, more ingrained proportions. Current use trends are deeply rooted in entrenched, often intertwined systems dependent on increasingly scarce resources, making solutions complex and costly to implement. Some problems are simply not subject to being solved in a reasonable costframe or timeframe once they are deeply embedded, no matter what progress might be made in relevant products or services.

Nature is actually quite fragile and small perturbations can produce large changes in natural systems. Despite more than four decades of environmental effort, a third of Americans live in areas that fail to meet minimum EPA air standards; a fifth of the nation's drinking water systems violate safety standards; and *per capita* solid waste has grown by a third, with lots of land pollution and little advance in waste management technology. A third of U.S. plants, a fifth of U.S. mammals and birds, and 40% of U.S. fish species are threatened with extinction. Fully half of our lakes and a third of our rivers fail to meet the swimmable standard of the Clean Water Act. Each year, U.S. industry routinely dumps about 25 million tons of toxic chemicals into the atmosphere and waters that find their way into our bodies and lives. Each year, our nation loses more than two million acres of open space to degradation and land use conversion.

Meanwhile, excessive use of hydrocarbon-based energy creates more air and water pollution and is the leading contributor to high and growing greenhouse-gas emissions that are driving the coming global climate disruption. Notably, the United States uses significantly more hydrocarbon energy *per capita* than any other developed nation (except Canada), despite having off-shored many energy-intensive industries and shifted toward a services-based economy.

Exhibit 2: Per Capita Energy Consumption, 2010



Source: Economist Intelligence Unit and the International Energy Agency. As referenced in Energy Realities, “Per Capita Energy Consumption 1990-2015,” February 2012 (accessed January 2015), <http://www.energyrealities.org/sustainability/per-capita-energy-consumption/>.

Residential electricity rates are high and should continue to climb, despite the current availability of low-cost natural gas given that about half of residential energy cost is in the transport and distribution (T&D) system, which needs constant renewal and expansion.

Longstanding dirty private sector behavior embedded in corporate cultures and well-known market failures account for the existence of most environmental problems affecting society, such as the coming resource exhaustion, inefficiency in energy and water use, and pollution emitted into our air and waters, so insisting that the problem source—the corporate sector—play a central role in the solution is both essential and appropriate. Government has not proven to be an effective enforcer of its own laws and regulations, whereas more such laws and regulations are, in fact, needed to help address the many environmental problems. NGOs can play a vital role in focusing the issues and generating public support but cannot alone carry through on solutions. As history demonstrates, we need more than government regulation and NGO advocacy to make environmental improvement happen; the key, ultimately, is changing corporate behavior and end customer purchase practices.

B. What is Not Working

As is well known, what is commonly termed “free enterprise” in the U.S. simply does not satisfy many of society’s legitimate and urgent needs. That is one reason why governments exist (along with regulation) and why charitable and other NGOs also exist (with their associated tax advantages), although, as noted, none has proven particularly effective with respect to the environment or many other pressing needs. Environmental problems are growing in scale and urgency for action.

Society’s failure to address and solve environmental problems stems from three broad realities.

1. The Bias toward the Short-Term

One reason for the failure to address environmental problems is the short-term bias wired into the human brain and into our resulting human institutions. Behavioral economics tells us that we humans tend to discount the future by up to 50% (which explains why so few people save for retirement). This short-term bias explains the very high discount rates used in capital budgeting by both industry and government—and, indeed, even in consumer spending on energy-saving appliances—and the emphasis on short-term valuation of business results (often referred to as *Quarterly Capitalism*) with insufficient emphasis on what it takes to build or sustain a great, renewing company for the longer term.

As a consequence, we see the tendency to avoid “first cost” dependent investments (even with superior “life cycle” costs), defer spending on renewing industrial infrastructure (the deferred maintenance problem), a focus on product line elaboration (“flanker” products) rather than fundamental product innovation, and a tendency to exhaust scarce, often significantly underpriced, natural resources, thanks to the omnipresent short-term bias and a complex, low-visibility web of federal, state and local subsidies, implicit monopoly and other factors limiting intelligent economic behavior by corporations.

Building a new business or corporate capability can typically take five or more years, yet public companies are largely influenced by the tyranny of the short term, thus radically diminishing the importance of the longer view. Add to that the fact that most corporate CEOs have an expected future tenure of only six years (down from 10 years back in the late nineties), so a structural lack of interest in moving toward longer-term corporate health and better citizenship to benefit all stakeholders is perhaps understandable in the executive suite.⁵

In 2010, public and private pension funds and other large financial asset holding institutions controlled approximately \$10 trillion in equities, corporate bonds, and treasury securities in the United States, a figure that dwarfs the impact-oriented investment clout from private sources such as single individuals and family offices.⁶ Public and private pension funds and other large financial asset holding institutions could influence corporate behavior toward treating all stakeholders (not just shareholders) fairly and making long-term investments that could better serve their constituents, including improved environmental management. Yet, asset managers and their advisors also tend to be prisoners of a powerful short-term bias, looking only at immediate economic results, heavily influenced by Wall Street’s bias toward the short-term in its performance reporting and investment recommendations.⁷

2. The Problem of Externalities

An externality is a cost or benefit that affects a party that did not choose to incur that cost or benefit. For example, manufacturing activities that cause air or water pollution impose health and clean-up costs on the broader society. If externalized costs exist, such as air pollution, the producer may choose to produce more of the product than would be produced if it were required to pay all associated environmental costs. If there are external benefits, such as in public safety, less of the good may be produced than would be the case if the producer were to receive payment for the external benefits to others.

⁵ McKinsey & Co.

⁶ U.S. Census Bureau Statistical Abstract of the U.S. ,2012

⁷ As Gus Speth said in his book published a few years ago, “. . . there are fundamental biases in capitalism that favor the present over the future and the private over the public. These biases lead directly to a general overexploitation of natural resources and make folly of the term “sustainable development.” *The Bridge at the End of the World*, 2009.

Overall cost and benefit to society is defined as the sum of the imputed monetary value of benefits and costs to all involved parties. Thus, for goods with externalities, unregulated market prices do not reflect the full societal costs or benefits of the transaction. Such externalities abound in environmental matters where the tradition in the U.S. has been light to often-unenforced regulation.

3. The Problems of the Commons

A paradoxical situation occurs when the depletion or impairment of common resources by individuals and organizations, acting independently and rationally according to each one's short-term self-interest, act contrary to society's longer-term best interest by depleting, misusing or poisoning the common resource. Fishing out the seas as a source of world protein is a commonly cited example, owing to new fish finding technologies and excessive fishing subsidies offered by some nations.

The problem of the commons is often cited in connection with sustainable development, meshing economic growth and environmental protection for a sustainable future, as well as in the issue of mounting disruption to our global climate. The "Commons" include increasingly scarce resources such as certain sources of energy and metals (*e.g.*, rare earth elements essential to technology-enabled products), as well as the earthly elements necessary to sustain life (*e.g.*, phosphate, a key ingredient in the green revolution to supply food to an ever expanding world population).

These three realities are magnified by the presence of *complacency* in industry practices. While text books speak of competition as the driving force in markets, in reality many business practices are complacent, sub-optimized and frequently uneconomic. Aside from the powers of monopoly/oligopoly and subsidy as factors promoting noneconomic behavior of many markets, we have unresponsive buyer behavior by highly-grooved corporations. To motivate a corporation to adopt a new, cleaner, more cost-effective product, it is usually necessary that the product have a very low capital cost ("first cost") and also a *life cycle* cost that is at least 30% to 40% below the established product on which the company or industry has, in effect, standardized. This is a form of *split incentives* in which the staff managing the purchasing function in many corporations is highly risk averse and not incented to seek the most economical solution, particularly where life cycle costs must be traded off against capital costs. There are many examples of market resistance to energy-saving technologies, despite continuing high and volatile hydrocarbon energy costs.

Taken together, these factors largely explain the limits of markets in solving certain societal needs. What makes these forces all the more effective in limiting social good is the fact that the business world holds such sway over the outcome (witness its power over governments through corporate campaign donations and special interest lobbying). In many, if not most ways, business runs America.

Clearly, business is the most powerful institution in most economies and its incentives strongly favor the immediate term, ignoring externalities, and failing to lead in responding to problems of the commons. Government is clearly a secondary player in American life, while the NGO or voluntary community trailing as a distant third in terms of clout. Without changing the behavior

of Corporate America, there is little prospect of curing certain environmental problems and many other societal ills.

II. The Role of Impact Investing

The fact that most innovation does not originate in large, established companies is well known. Most large companies are implicitly committed to defending their position and to the lower risk approach of incremental improvements (rather than fundamental innovation). Instead, it is the early companies founded on a bold concept by passionate leadership that usually produce the most impactful market innovations. The authors refer to the companies as the *attackers*.⁸ These are the companies that have the innovation and the courage to attack large established markets with entirely new ways of meeting customer need. Impact investing has a special role in supporting these innovations by investing in attacker companies that are working to improve resource efficiency and promote clean economy practices.

Business provides the goods and services (and the externalities) and commands the vast majority of capital employed in our economy. If society is unsuccessful in shaping business activity by introducing new clean products and services into our unclean economy and/or changing negative short-term behavior of existing businesses, our society will be operating only at the margin in working to improve environmental health and safety. Since businesses not only deploy capital, but are in constant need of more capital to feed growth, capital investment is arguably an important lever where significant positive impact should be achievable.

A central tenet for fixing the most persistent societal problems—particularly environmental problems—is that they generally require relatively large amounts of capital and staying the course over a number of years (gnarly environmental problems are costly to solve and yield only slowly). Social capital such as philanthropic giving is generally insufficient in scale, though it can sometimes play an important catalyzing role. Government capital is often misdirected, inconsistent in focus, subject to political sway, and also generally insufficient in scale.

Therefore, the direct involvement of the private sector in growing successful companies with the financial strength and staying power to produce industry revolutionary outcomes is essential to societal progress on environmental problems. Investors interested in impact should be concerned with unlocking and appropriately directing institutional and industrial capital into environmental markets. Without being able to draw private capital that has investment choices into developing clean economy markets, there is no real prospect of overcoming these problems. It is the promise of attractive economic returns—not societal co-benefits—that will draw sufficient amounts of private capital into these markets.

Once framed in these terms, the investment solution becomes clear: *Impact Investors who invest for non-compromised economic returns in valid companies that produce resource-efficient and clean products and services with high economic value to the customer, particularly when working in concert with like-minded investors to unlock sufficient capital resources to help move those companies to scale, offer the best opportunity to engender broadly-available, sustainable*

⁸ See Richard N. Foster, *Innovation: The Attackers Advantage* (Summit Books, 1986).

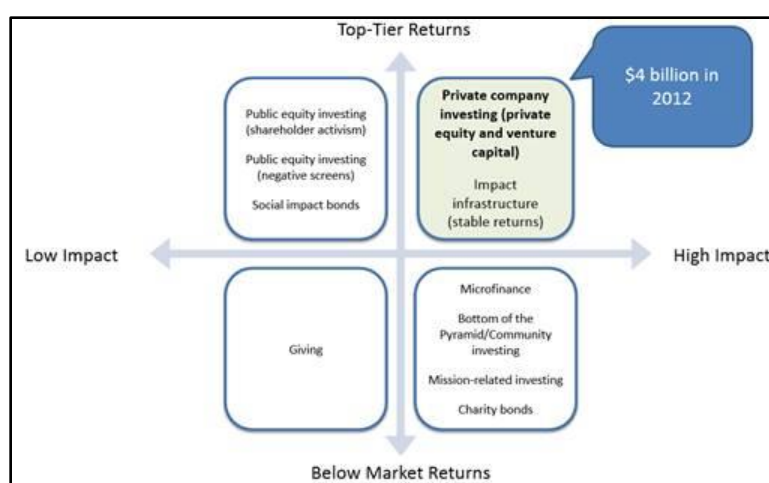
environmental solutions as these companies gain efficiencies of scale and full access to the capital markets.^{9,10}

III. The Virtuous Quadrant

The ways Impact Investments can be made include Private Company Investing (Private Equity or Venture Capital), Infrastructure Investing, Public Company Investing (both activist and passive negative screens), Social Impact Bonds, Microfinance, “Bottom-of-the-Pyramid”/Community Investing, Charity Bonds, and straight Philanthropic Giving. Not all have the same potential for achieving broad-based, sustainable impact or the potential for top-tier monetary returns.

The Virtuous Quadrant of top-tier economic returns and top-tier societal co-benefits exists and, in the view of the authors, should offer ample opportunity for successful investing for both target outcomes, as Figure 3 depicts.

Figure 3. The “Virtuous Quadrant” of Sustainable Impact Investing¹¹



Source: NewWorld Capital Group

Note that \$4.0 billion is estimated to have been invested in the Virtuous Quadrant in 2012, a good beginning for a recent idea. This amount is expected to grow rapidly in the years ahead.¹²

⁹ The authors refer to this challenge as moving across the “Commercialization Gap”. The Commercialization Gap is commonly defined as that period in a company’s development before it achieves full efficient operating scale and can command external growth capital at competitive rates vis-à-vis large, established competitors. It is the period of greatest risk to the future of many companies.

¹⁰ See the authors’ essay titled “The Pleasures and Perils of Private Company Investing,” in the series *On Matters That Matter*, for an analysis of why younger, growing companies typically generate higher investment returns.

¹¹ The estimated \$4.0 billion of private equity invested in 2012 does not include funds solely seeking environmental impacts but does include funds seeking both social and environmental impacts.

¹² Tom Woelfel, Ben Thornley and Beth Sirull, *Market for Social Impact Investing by Private Equity Funds Stands at \$4 Billion in the United States*, Pacific Community Ventures Insight Publication, July 2012.

This memorandum focuses on private and public company investments because they can attract and absorb significantly more capital than smaller microfinance institutions, for example, and can, therefore, effect societal change at a much greater scale. Similarly, the memorandum does not address below-market return investments, such as microfinance, charity bonds, bottom-of-the-pyramid investing, or charitable giving, since the amount of capital at work in these quadrants is small relative to the capital available in private and public markets with investors that seek market-based economic returns. Nor does it address infrastructure investing because, even though such investments can have an important impact in implementing newer solutions at scale and typically provide attractive, bond-like returns, they also require large amounts of capital and are typically deploying solutions that have already been adopted at scale elsewhere in the marketplace. The authors believe that infrastructure investments typically require such large amounts of capital that they should not be a significant focus for most HNW and family office impact capital.

III. Framework for Analysis

In order to help the United States transition toward a clean economy while allowing investors to earn attractive economic returns, the authors advocate an approach focused on (i) framing each environmental problem as a *Target Problem* in terms of a *Population of Need* and how best to generate benefit for that Population, and (ii) applying an investment analysis framework built on eight overarching themes that together can help identify the most promising roadmap combining maximum environmental solutions impact with uncompromised economic returns. This approach is similar to the diligence approach that should be followed in considering any direct investment in a private company with the exception of the requirement to weigh the societal benefits explicitly.¹³

A. Overarching Themes

There are eight overarching themes are:

1. *What is the Target Problem or Population of Need to be served through the investor's Impact Investing? How should the investor define the benefit/impact sought vs. the Population of Need? What outcome objectives should be set in what timeframe?*
2. *What is the proper role of industry segmentation and business system analysis in designing an Impact Investing program? How can these insights help Impact Investors identify and diligence more impactful investments with a higher probability of success?*
3. *How should Impact Investors go about managing investment risk in their investing activities? What is a sensible program of risk mitigation for an Impact Investor? Do impact investments carry a higher level of investment risk than more traditional investments?*
4. *What is required to affect private enterprise (corporate) behavior through a particular Impact Investing program? What is the case for investing in young clean economy attacker companies to create new competition to established players in certain dirty*

¹³ This memorandum does not address issues of capital structure design, how to assess capability of a management team and certain other topics customarily part of a due diligence effort, as these topics are common to all types of private company investing.

markets? What is the case for attempting to change corporate behavior in other ways, either through direct action or via influencing the investment behavior of large asset-holding institutions?

5. *What is the case for “show-the-way” investing to demonstrate impact at the individual company level?* How can initial impact capital draw in subsequent larger investors (both impact-oriented and non-impact-oriented investors) to broaden the solution impact and help take the new business approach to market scale?
6. *How should investors think about the need for collaboration in Impact Investing?* Are investment coalitions needed for successful pilot projects and can such coalitions lead to larger, more impactful investment coalitions when it comes time to take a successful pilot to market scale?
7. *What is a balanced program that can both achieve impact objectives and also protect/restore the corpus of the investment resource?* Since Impact Investing requires substantial resources applied over a multi-year timeframe, it is imperative that the corpus of the investment resource be renewed from investment returns both from Impact Investing activities and perhaps traditional investment approaches as well.
8. *How has Impact Investing performed as an emergent asset class?* What is the economic case for or against investing in impact-oriented investment vehicles (informal or formal investment clubs, specialized private equity funds, specialized venture funds)?

A discussion of each of these themes follows with the intention of providing operational detail on how smart investors can take advantage of each theme.

1. Defining Impact in Terms of the Population of Need

Impact Investors seek to achieve a specific beneficial outcome against a *Target Problem* often defined in terms of a *Population of Need*.¹⁴ In the case of environmental problems, the Population of Need may be defined as a segment of individuals or institutions in society suffering from poor or dirty products, active harm by a product or process (such as the recent massive chemical release into the Elk River in Charlestown, West Virginia), or excessively costly products and services. Alternatively, it can be seen more broadly as an entire population adversely affected by a degraded ecosystem, such as municipalities suffering from local air pollution or poor drinking water quality.

Many impact investors and foundations use a broad framework to define the target Population of Need which, while noble in intent, is often too broad to create actionable and measurable results. Investments made within the fuzzy outlines of an overly broad goal often miss the intended impact, as diffuse amounts of capital committed to a range of related topics tend not to coalesce into a real impact outcome. Major problems, such as environmental degradation and inefficient resource use, should be broken down into component parts that can be attacked individually, perhaps from different perspectives. True impact is more likely to be achieved by framing the

¹⁴ Some Populations of Need may not view themselves as suffering from dirty or inefficient products, but may recognize symptoms such as high and growing cost of electricity or water, or recognize that their businesses are subject to fluctuations in hydrocarbon pricing, or that the company itself is publicly branded in a way that detrimentally affects sales and company value. Such problems of this commercial Population of Need can be mitigated by selling appropriately efficient and clean products or services with the multiple purpose of positively impacting the environment, earning an attractive return, and improving the company's overall reputation.

Population of Need more narrowly and understanding how impact capital can address each piece of a larger challenge.

Below are examples of possible Populations of Need that can be addressed through Impact Investing, illustrating the wide range of possible definitions of Need (arrayed from broad to narrow in definition):

- *Commercial and industrial end users subject to inefficient energy use and poor emissions controls* that could be mitigated by purchasing new, clean-economy products or services. Walmart, for example, uses 40% of its total consumed electricity to cool its buildings. What would be the impact on store margins and greenhouse-gas emissions if this energy use were cut in half through adopting energy-efficient compressionless air conditioning?
- *Municipalities with high capital expenditures for water and wastewater treatment, waste stream management, and related services* that need to shift to lower-cost distributed water processing. Distributed processing of wastewater for appropriate re-use costs less in capital commitment and is typically underwritten by the originator of the wastewater (not the municipality). The theme is treating wastewater to its purpose, not to a potable standard, thus further reducing water processing costs.
- *Residential consumers paying excessive amounts on their utility bills while being resource inefficient in their electricity use* and reliant on poorly insulated buildings and outdated, energy-inefficient appliances. Many areas such as California have sky high electricity rates and few incentives to promote efficient energy use by consumers. Most homeowners live in energy-inefficient homes and use energy-inefficient household appliances. How can energy efficiency be effectively promoted to the energy-consuming consumer population?
- *Low-income populations living near shipping ports, airport terminals, and other transit hubs* where idling vehicles contribute to degraded air quality. For example, diesel particulate filters retrofitted on older trucks would significantly reduce local diesel emissions. Many states and locales have such regulations in place but very few enforce them. Diesel emissions are viewed as a Tier 1 Carcinogen by the World Health Organization.
- *Populations in low-income areas where lead-based paint has been used in older, lower-income apartments.* What kind of special project assistance and financing can be conceived to remove lead paint, which is a major health hazard particularly for young children?

In the view of the authors, Impact Investing should contribute directly to creating tangible benefit for individuals and institutions suffering from inefficient resource management or lax pollution practices by investing in and supporting attacker companies that provide alternative clean and resource efficient products and/or services. As a result of these investments, the Population of Need should benefit from less pollution, lower resource costs, more efficient operations, and a healthier living environment.

Two broad avenues exist to achieve impact through Impact Investing. The first is to channel sufficient funds and effort directly at the problem with the intent of solving it for the Population of Need and putting in place the resources, systems and controls to keep the solution working through time. For example, NewWorld invested in Coolerado Corporation, a company that manufactures highly energy-efficient commercial air conditioners to address inefficient energy

use by large commercial and industrial companies and the consequent need for public utilities to build natural-gas-fired energy peaking plants in response to peak summer air conditioning demand. Coolerado required growth capital in addition to sales support, industry connections, and a redefined business strategy to create a self-sustaining company that will continue to provide value to commercial energy-consuming customers (a Population of Need) over the long term.

The other avenue is to carry out a successful pilot or demonstration project with the intention of subsequently raising additional capital to extend the successful project to full market scale. An example might be creating a dedicated service to work with low-income apartment residents in removing lead paint and repainting to upgrade the apartments, with the goal of assembling additional resources later to take such a project to scale in target low-income areas.

The first avenue is obviously preferable in that it funds to a sustainable market solution, while the second depends on an additional funding base to take the solution to scale.

In many ways, a successful impact investor or private equity fund focused on environmental opportunities acts on both fronts, investing in companies with direct impact and acting as a “show-the-way-investor” on such issues when the investor can demonstrate to the larger investment community that financial returns need not be sacrificed in order to achieve beneficial impact. In this way, an early-mover investor can help pull larger investors into the impact investing arena, hopefully drawing in much needed additional capital to meet the scale requirements of addressing urgent environmental problems.

Impact investors, as part of an analytical approach to finding the most impactful form of investing, should also consider bottlenecks and other points of resistance to their chosen Population of Need. Ideally, investors should target Populations of Need that do not suffer from bottlenecks or other resistance points as they obviously increase investment risk and may detract from the potential return and timing of impact. However, individuals, families or institutions focused on debottlenecking certain industries are certainly an important component in creating ultimate impact. For example, upgrading energy efficient appliances in cities is limited by *split incentives* between building owners and tenants. In this situation, it may be more impactful to work on overcoming this problem by supporting advocacy organizations dedicated to policy reform or developing new financing mechanisms to support the purchase of energy-efficient appliances.¹⁵

In addition, applying an industry segmentation analysis and a business system analysis (as discussed below) can help frame the most promising segments or sub-segments and their changing needs, market formation and business scaling issues, and other considerations to identify lasting solutions for a Population of Need.

Full understanding by the Impact Investor of the Population of Need to be served should lead invariably to a desire to collaborate with other Impact Investors or change agents, since no single source of impact capital is likely to be sufficient to have a permanent beneficial effect on a Population of Need. Having a strong vision of the value to be created for the Population of Need should help in assembling the necessary investment coalition.

2. Industry Segmentation and Business System Analysis of Impact Investing Strategies

¹⁵ In New York City, the Urban Green Council is a dedicated non-profit focused on these issues.

Good business strategies begin with both a target industry segmentation and a business system analysis. In the authors' opinion, this kind of analysis should also be applied to impact investment strategies, especially those focused on outcomes in the form of economic returns and measurable societal impact.

Industry Segmentation Analysis: Where to Invest?

Industry segmentation and stage of industry development segmentation are two important factors in deciding where to invest for both economics and impact.

Growing industries are generally easier to enter, while industries that are either very young or more mature are likely to be more risky or difficult to enter: young industries may feature a great deal of uncertainty, particularly in their channel-to-market strategy and market acceptance, and old industries tend to be deeply rooted and conservative in their business practices, including product purchase behavior. Capital-intensive industries should, in general, be avoided, as they require large amounts of capital in order to participate, and it is difficult for a new clean economy company to dislodge an existing old-line competitor in a market with conservative, often non-economic ("crusty") buying practices. Similarly, highly regulated industries may be organized to protect existing players and restrict access to new entrants.

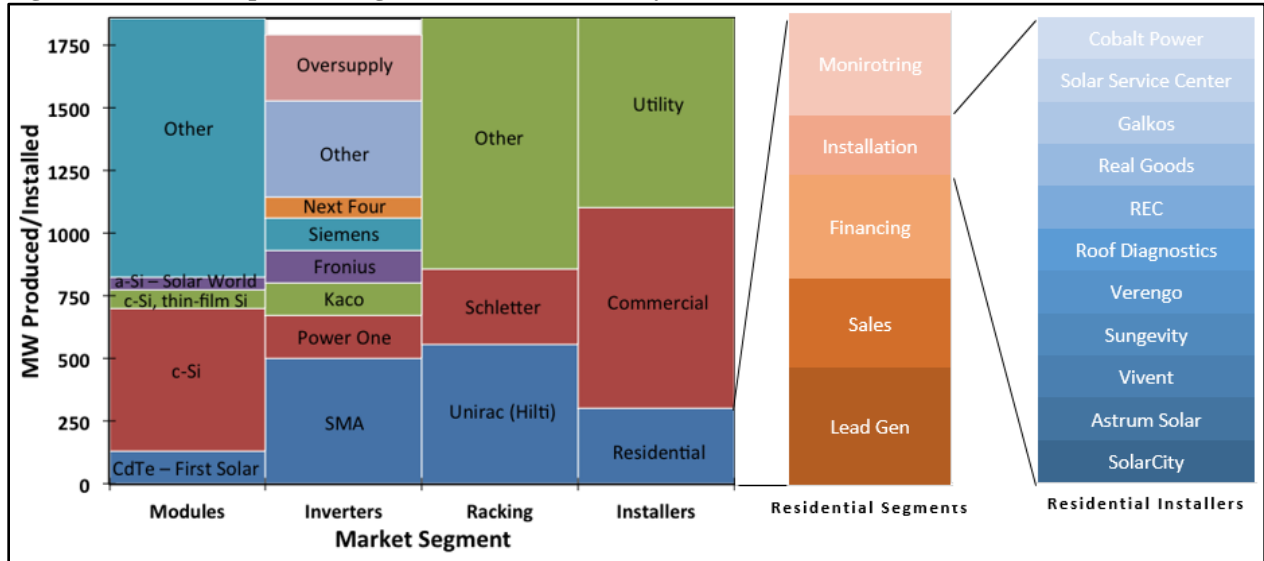
Probing issues in industry segmentation helps to frame and answer questions such as the following:

- *What industry segments or sub-segments offer the most promise in generating a lasting solution for the target Population of Need?*
- *How are the target industry segments changing through time? What is driving the change? Is the Population of Need growing more urgent? Is the Need changing through actions by the private sector or by government?*
- *What is happening to market formation? Are the segments growing rapidly or are they becoming more competitive? Is industry consolidation beginning to occur or expected to occur soon? Are there currently any winners ("envied competitors") serving the Population of Need?*
- *What is the scale requirement to address the Population of Need? Does the investable company have to operate at significant scale in order to achieve market-accepting unit cost economics? What generally is the fixed-variable cost dynamic and the operating leverage in the business? What does this say about *Minimum Efficient Scale* to participate in the market?*
- *What is the risk of a technology "skip" upsetting the industry segment? Is there product functionality risk? Is there manufacturing scaling risk? How might these risks be mitigated?*
- *What other segment-level investment risks are present? Does regulation or government subsidy drive demand? Is there hydrocarbon pricing exposure? Does the company compete with advantaged government-supported foreign competitors?*
- *What does the test of Backwards Compatibility say about the likelihood of the new product or service being accepted by the downstream sales and after-sales service system without generating significant disruption? Will the buying process accept the*

new clean economy product? Does downstream acceptance require significant infrastructure investment by government as a public good?

An important step in thinking about where to invest is developing a *Market Map* to isolate the most attractive investment segments (in this example, the asset-light, customer-facing end of the residential solar market segment) in an industry segment consistent with investor readiness to accept risk.

Figure 4: Market Map: Asset-Light End of Solar Industry with a Focus on Residential Installers



Source: NewWorld analysis.

The challenge is how to identify one or more industry segments for investment where the benefits of success for the Population of Need are material and the prospects of success are encouraging.

The next step is to understand the characteristics of winning strategies in those targeted industry segments. For example, in the broadly defined energy efficiency market, the following questions suggest the kinds of companies most likely to succeed:

- *Does the product line have a high level of functionality, providing significant Economic Value to the End Customer (“EVC”)?*
- *Is the product technology strong, distinctive and defensible?*
- *Does the product line benefit from low “first cost?” Or can the company provide financing to convert a capital cost to an operating cost for the end customer (most industrial customers prefer operating costs over capital costs)?*
- *Does the product line demonstrate effective monetization of products and services? Is the company capable of generating and growing operating margins?*
- *Does the company follow a niche market focus? Niche strategies can often win against—or not compete directly with—large incumbent players.*
- *Does the company have a group of nationally recognized customers or significant customer adoption? Can these early customers be used for “reference selling?”*

- Does the company take advantage of—but not be dependent on—existing regulations and subsidies?
- Is the product line “backwards compatible”—capable of fitting into the existing downstream distribution and after-sales service systems without provoking too much change?

*Business System Analysis: How to Invest?*¹⁶

A Business System is a deceptively simple tool to map a company’s flow of activities from its basic technology through to after-sales service, noting each intermediate step and the choices presented in each step in creating an integrated business proposition. Evaluating this in a company should be an essential component to a strategy devoted to most effectively impacting the Population of Need, because efficient well-run businesses will bring more to the market than simply an excellent product—a truly impactful investment may also bring business system innovation alongside product line innovation.

Examples of business model innovations in the clean energy space include more efficient residential solar installation companies (e.g., Astrum Solar) and crowd-funded solar projects (e.g., Solar Mosaic). In the case of Astrum Solar, the business features greater capital efficiency than its competitors, higher levels of customer satisfaction, lower customer acquisition costs, and higher quantities of deployed solar per roof—in addition to a rapidly growing platform in a fast-growing market. By supporting this company, investors are supporting the impact that comes with appropriate business efficiencies: increased penetration of clean energy in the form of residential solar, full-time, non-exportable jobs for installers, and a likely attractive return on capital employed.

Below is a summary depiction of a Business System for a technology-based manufacturing company.¹⁷

Figure 5: Sample Business System Analysis



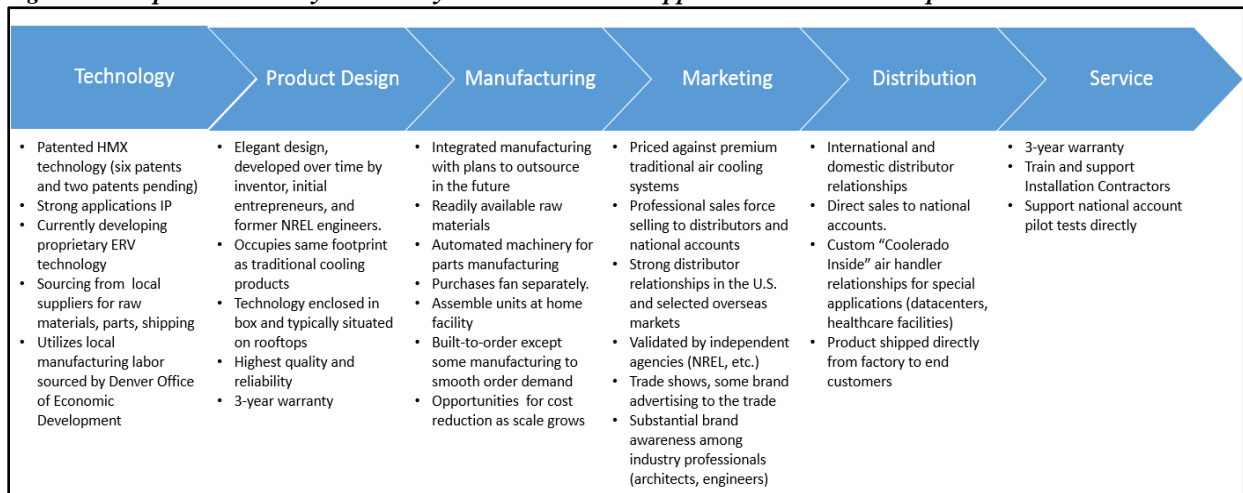
Source: McKinsey & Co.

¹⁶ Also known as the “Value Delivery System” or the “Value Chain”.

¹⁷ Source: *Enduring Ideas: The Business System and Competitive Cost Analysis*, by Carter F. Bales, PC Chatterjee, Donald J. Gogel and Anupam Puri, McKinsey Staff Paper, 1980.

Here is the Business System analysis framework applied to Coolerado Corporation, a NewWorld portfolio company.

Figure 6: Sample Business System Analysis Framework as Applied to Coolerado Corporation



Source: Coolerado Corporation and NewWorld.

Understanding the Business System can help to frame and answer questions such as the following for a possible impact-oriented business investment:

- *How does the target company perform each function?* Is there a better, way to do it? Would changing this function increase or decrease value to end customers? How do leading competitors perform this function? Does their approach provide more value to its end customers or cost less to execute? How might changes in the external environment affect how this function could be performed? Is there a risk of *technology skip* in the function?
- *How does the operation of the function fit with what is being done in other stages of the company’s Business System?* Is the business strategy truly integrated for competitive advantage? Is the Business System simple (better) or complex?
- *Is the end-customer buying process economically rational or traditional and change resistant?* Does the Business System require extensive change in the already existing downstream industry sales and service system (which usually leads to adoption resistance by downstream system players)? In the case of a growth company in the energy efficiency space, end-market purchases are likely to be slower and less economically-driven than suggested by the size of the energy savings because of issues like split-incentives in the built environment and change-resistant corporate cultures.
- *Are subsidies and other regulatory actions needed in order to motivate product adoption (and how heavily subsidized are the existing products with which the new cleaner products must compete)?* One major challenge for growing energy services and other efficiency companies is finding paying customers outside the “MUSH” market.¹⁸ Stricter building codes and state/federal regulation can help drive private markets but “voluntary” implementation of energy efficiency retrofits is still slow.

¹⁸ “MUSH” stands for the Municipal, University, State and Hospital markets.

- *What will facilitate or inhibit the successful delivery of the product or service to the Population of Need and how can resistance points be overcome (if they can)?* In energy efficiency products, a 3-year payback or faster is often required for a commercial customer purchase decision. Potential customers also usually require successful pilot installations and verified savings in order to ensure savings before making a purchase decision.
- *What is the path for building a valid business to competitive scale?* Does scaling require significant investment or can it be accomplished with existing facilities or more-of-the-same manufacturing? What is the opportunity for outsourcing manufacturing? What additional resources and market channels are needed? Customer-facing solutions may be proliferating, but it can be difficult to determine if these companies can be profitable, especially as a market becomes more competitive.

These and other related questions should be answered as part of understanding the likelihood of ultimate success in serving a Population of Need through a particular Impact Investment. Identifying limits and resistance points in a company's Business System is key to making a smart investment decision that maximizes the likelihood of success and minimizes investment risk.

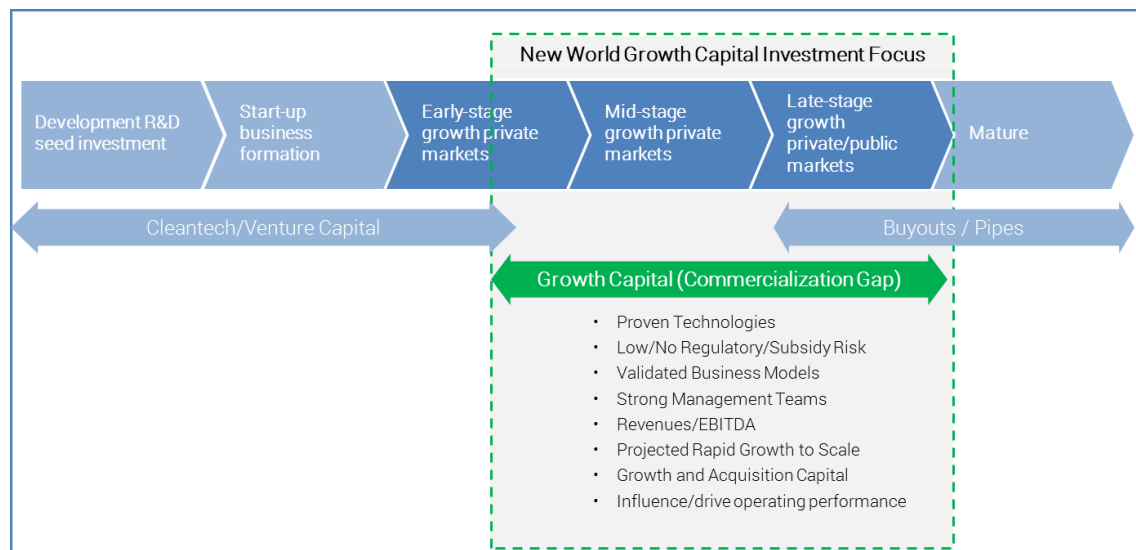
For example, investments in Carbon Capture and Storage (CCS) technology have to overcome at least two major obstacles: the capital intensity of moving from a test facility to a scale facility (the "Valley of Death"), and delays in permitting, together with local citizen resistance to piping captured CO₂ to a location for ultimate disposal. Another example is the large downstream systems investment by federal and state governments needed in connection with a biofuels distribution system. CCS and biofuels are two investment areas the authors believe Impact Investors should avoid, since impact investments in these areas are less likely to prove effective.

Business System Analysis: Where and When to Invest?

The stage of a company's development is also an important Business System consideration. At what stage of business development should an Impact Investor choose to invest and why? Where can the most impact be made? What needs to happen in order to achieve real, sustainable impact to benefit the Population of Need? How far away (timeline) is real impact?

As Figure 7 indicates, the stages of business development can be broadly divided into Cleantech/Venture, Growth Capital, and Buyouts/Pipes/Public Securities. The authors believe that the most impact can be created by private investing in growing companies in the growth stage in the middle and lower-middle market.

Figure 7. Stages of Investment



Source: NewWorld.

Providing Cleantech/Venture Capital. More good ideas die on the vine than are born in a typical year, owing to lack of capital, market access challenges (old-line product purchasing practices), competitive response from established players, insufficiently developed management teams, and the like. The risk associated with early stage ventures is evidenced by trends in the venture capital community, where three out of four start-ups fail and, consequently, many investors have been moving their strategies toward less risky, revenue-generating investments.¹⁹ Of all start-up companies, about 60% survive to age three and roughly 35% survive to age 10.²⁰

Globally, the share of investment directed to companies generating revenue increased from 55% in 2006 to 74% in 2012 in terms of deal value, replacing capital previously directed at product-development stage companies. However, because these investors are generally venture funds, which tend to be smaller in scale than most private equity funds, they have been deploying smaller amounts of capital into later-stage investments, in many cases creating undercapitalized middle and lower-middle market companies.²¹

In the judgment of the authors, the death rate on new ideas born in the venture world is simply too high, particularly in the environmental field where innovation may produce many products that work but are not destined for commercial success in light of widespread institutional marketplace resistance to innovative products. However, we state this view as a personal opinion and do not expect the broader impact investing market to embrace it. It is simply our view in our effort to balance risk and reward in investing and in drawing follow-on capital into worthy companies.

¹⁹ Deborah Gage, "The Venture Capital Secret: 3 Out of 4 Start-Ups Fail," *Wall Street Journal*, September 20, 2012.

²⁰ U.S. Bureau of Labor Statistics and the Erwing Marion Kauffman Foundation. As referenced in Deborah Gage, "The Venture Capital Secret: 3 Out of 4 Start-Ups Fail," *Wall Street Journal*, September 20, 2012.

²¹ Ernst & Young, *Turning the corner: Global venture capital insights and trends 2013*, 2013.

Assuming the majority of venture investments fail to produce an economic return for their investors, the potential societal benefits of those companies' products or services are also lost. If investors are most concerned with providing a sustainable and lasting impact through their investments, the authors believe they should consider investing in companies that are more likely to succeed. A proxy for likelihood of success can be middle and lower-middle market growth stage companies that have proven technologies, repeat customer orders, validated business models, and reasonably built-out management teams.

Providing Growth or Growth/Control Capital. For many, if not most, environmental problems we do not need new solutions as many workable solutions are already in the market and seeking to attain full commercialization. These companies need to take sub-scale solutions that work to commercial scale where they can achieve competitive unit delivered cost and acquire additional growth capital on competitive terms.

Within the private and public company markets, the authors believe that the greatest potential for top-tier returns combined with the biggest impact opportunities lies in middle and lower middle market private investment into clean economy growth companies. Growth capital private company investors are able to avoid many of the technology and capital and business scaling risks associated with venture investing, frequently seeing the majority of their portfolios reach commercial scale. The higher survival rate of their investments leads to more product adoption, and therefore more impact as their products penetrate the clean economy marketplace.

Private company investing at significant scale may allow investors to negotiate certain protections and controls that more easily and efficiently enable them to support management teams as they transition to cleaner, more sustainable operation.²² Investors in private companies, especially those where they control the board of directors, have a greater ability to influence management directly and encourage even greater pursuit of impact and sustainability practices. These investments may come from individual investors through an informal club of like-minded investors, or via a strategy-driven private equity fund committed to top-tier economic returns coincident with also achieving societal co-benefits.

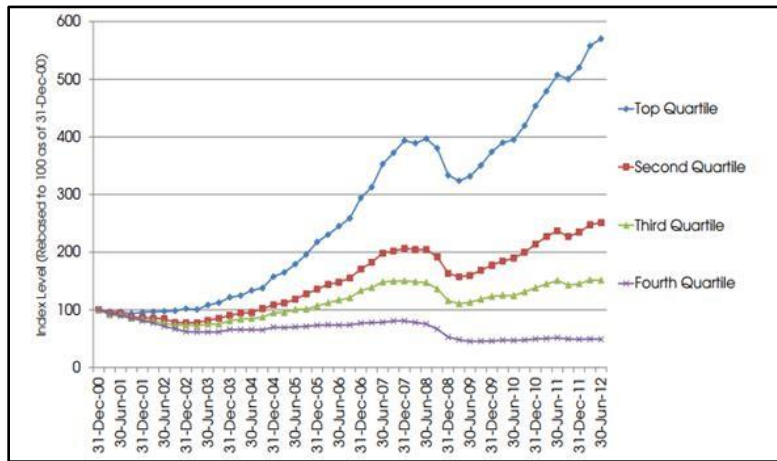
Impact investors seeking to invest in growth stage companies may find that it is a very labor-intensive process to find these kinds of companies, develop relationships, structure transactions, grow the companies, and seek suitable exits. In this case, fund investing may be the preferred avenue of investment.

On a fund level, data suggests that median private equity returns have well exceeded even levered public equity indices for more than a decade.²³ As shown in Exhibit 8, even fourth quartile private equity funds have outperformed or been nearly equivalent to average S&P 500 performance since 2000.

²² See the authors' essay titled, "The Pleasures and Perils of Private Company Investing," in the series *On Matters That Matter* for an analysis of risk reduction and control techniques available in private company investing.

²³ Based on data and analysis from McKinsey & Co.; Cambridge Associates (for PE IRRs); Preqin (to construct cash flow matching for the S&P 500); and Bloomberg.

Figure 8. Private Equity Index by Fund Performance Quartiles vs. S&P 500 Returns



Source: Preqin.

The higher performance of private company investing in recent years is particularly true for middle market and lower-middle market private equity investing. As of yearend 2011, U.S.-based buyout firms with under \$400 million AUM had a 17.5% pooled average return since 1979 and cumulative returns for larger buyout funds (greater than \$5 billion AUM) averaged only 6.7%.

Figure 9. Cumulative Returns since 1979 by Investment Size (as of Yearend 2011)

	Small Buyout (less than \$400M)	Medium Buyout (\$400M - \$1,000M)	Large Buyout (\$1,000M - \$5,000M)	Mega Buyout (\$5,000M plus)
Cumulative Returns	17.5%	15.0%	9.1%	6.7%

*Venture Economics. Pooled average returns since 1979 for U.S. based buyout funds as of December 31, 2011.

Reproduced from Kristi Craig, “Making the Case for Family Office Investments in Small Private Equity.”

One explanation for this return gap is that younger, growing companies produce significantly higher *alpha* returns despite some additional *beta* risk even in the face of recent slow growth of the U.S. economy. Younger, smaller companies continue to be the growth engine of the U.S. economy.

The authors see the main promise of progress toward a clean economy in the relatively new generation of *attacker* companies that are offering clean economy products and services (solutions) into new, rapidly growing market segments. These are typically products and services aimed at improved energy efficiency, clean, renewable forms of energy, improved water management technologies and products, and smart ways of addressing the waste-to-value puzzle.

Many of these attacker companies are addressing a valid and growing market need, have high-value products or services, and have already assembled an appropriate management team. Too

often, however, these companies are not sufficiently well capitalized and urgently need growth investment commitments from smart investors. Most such companies are still too young and small to attract institutional or public market capital, so their challenge is to fund themselves across the *Commercialization Gap* to a point where they get the benefits of scale and credibility to acquire growth capital at rates comparable to their established larger competitors, with more funding than traditional venture investors typically provide. Examples here are companies in distributed residential solar installation or in certain energy efficiency markets, such as compressionless air conditioning.

Industry segmentation and Business System analysis help situate and direct investors in the impact investing universe. Importantly, these analyses raise the interesting question of how industries change and reorient themselves to new attractive propositions such as those provided by more resource-efficient and cleaner products or services. While the obvious answer may be through product innovation, market evolution and aggressive competition, the authors see another form of industry change in which an established industry adapts because of superior, innovative products that help meet increasingly apparent demand.

For example, take the air conditioning market, now faced with increasingly costly energy and growing demand for more efficient forms of cooling. Large established AC companies are beginning to show greater interest in entering the compressorless air conditioning segment through acquisition of one or more attacker companies, in order to incorporate their technology into the acquiring company's product line, ultimately putting more sales effort and marketing behind low-energy air conditioning in recognition of the superior Economic Value to the Customer that these products bring. In, say, five years from now, will the development of the low-energy air conditioning market have changed the self-concept of the large AC companies and caused them to focus broadly on energy cost-effective air conditioning and heating management? Probably yes.

Investing in Buyouts/Pipes/Public Securities. Of all the possible impact investment stages, the most capital currently flows to public securities, partly because it has a long track record. Out of 5,175 ESG ("Environment, Social and Governance") strategies analyzed by Mercer Management Company, 57 percent were in listed equities, 20 percent were in fixed income, and the remaining 23 percent were spread across a range of alternatives.²⁴ Long before Impact Investors were so-called, some individual investors factored the negative social consequences of business activities into their public equity investment decisions, though most relied on regulation or philanthropy to address issues of concern. Public security Impact Investing offers a comfortable space for many Impact Investors because it has developed institutional infrastructure such as long-established funds, measurement tools, and reporting requirements offering a degree of accountability and transparency.

Public endorsement investments offer validation of companies with products or services and management teams dedicated to demonstrating smart resource management and environmental strategies and may provide healthy returns for investors. However, they are likely to provide less

²⁴ BSR, "Trends in ESG Integration in Investments," Report, August 2012; Mercer, "Responsible Investment's Second Decade: Summary Report of the State of ESG Integration, Policy, and Reporting," presented at the CalPERS Global Peer IESG Exchange, 2011; J. Ambachtsheer and K. Burstein, "Mercer's ESG Ratings Update: 5,000 and Counting. Mercer.com Insight, February 13, 2012, www.mercer.com/articles/ESG-ratings-update.

incremental impact—*i.e.*, in the environmental context, companies with management “enlightened” enough to make sustainability demands of their suppliers and/or make internal practices more resource efficient are reaping the rewards of that sensible strategy irrespective of an investor’s “endorsement.”

Endorsement investment in such companies may encourage company management to become even more committed to clean economy products and services, but environmental benefit is typically limited by the “lock in” of traditional practices and the reality of corporate economic incentives, which favor serving shareholders over other stakeholders, thereby dis-incenting companies from pursuing environmental initiatives with longer-term payoff.

Investing in public securities can act as a “gateway” to impact investing, with more substantial impact coming from more active involvement in company operations and pushing the company toward more environmentally friendly and sustainable practices. Some public securities investing can have this effect, where activist investors buy public securities in an effort to actively promote a change in corporate behavior. They are willing to drive ballot initiatives and wage proxy contests to get a public company to alter its behavior. These investors face steep challenges, but can sometimes drive results, particularly when they can work as part of a larger investor group and can gain Board representation. If these investors win, it can sometimes translate into a change in corporate business practices and possibly high returns, but these initiatives often fail and can consume substantial time and resources along the way.

3. Mitigating Risk in Impact Investing

All investors need to diversify their investments across a reasonably scaled portfolio of companies that feature a range of value and risk factors and hopefully deliver a low-correlation result against public market volatility. The authors see four ways to diversify risks:

- *Diversifying investments across industry segments.* Various industry segments in the environmental business sector have different value drivers and different risk factors and appeal to different end markets with their own degrees of cyclicity. Examples of widely varying end markets for environmental products include appliances, automotive, construction, electronics, and food/agriculture.
- *Avoiding or minimizing certain structural risks.* The Six Devils of environmental investing are: (i) technology risk (avoid it), (ii) government action risk (regulatory and subsidy risk (minimize it)), (iii) hydrocarbon pricing risk (minimize it), (iv) capital-scale risk (avoid large equity tickets), (v) foreign competitor risk (do not try to beat China), and (vi) business-scaling risk (understand and minimize it).
- *Balancing the investment portfolio in terms of growth-oriented, downside protected and high optionality investments.* The authors favor roughly a 60-25-15 distribution of investments, with approximately 60% of capital invested in growing companies in growing markets, 25% of capital invested in downside-protected companies or projects, and 15% of capital invested in younger, high optionality businesses with disruptive products but facing significant commercial scaling challenges.
- *Balancing the investment portfolio in terms of horizon risk.* Include several early exit (*Horizon 1*) deals in the portfolio with the intent of returning a portion of invested capital

before the next economic downturn hits. Aside from impacting exit multiples, recessions often dry up the supply of acquisition debt, which restricts the buyer's ability to pay the seller's price.

Note that technology risk in environmental businesses is usually present and particularly difficult to assess. Technology risk goes beyond the traditional definition of science or physics uncertainty. Here are some hints on how to view technology risk:

- *Gross margins.* If a product has yet to sell at a positive gross margin, it is uncertain whether its perceived value to customers exceeds its cost.
- *Degree of differentiation.* Dramatically differentiated (novel) technologies may be difficult to explain or sell, so adoption may take longer than expected and be too costly.
- *Risk of manufacturing scaling.* Many environmental business technologies require greater infrastructure to scale than other technology plays such as software and biotech. Accordingly, the investor should evaluate whether the manufacturing capacity of a technology is plausibly expandable, ideally by outsourcing additional manufacturing or adding "more of the same" manufacturing infrastructure.
- *Limited system integration.* Inability to "plug into" existing infrastructure and technologies is an often overlooked component of technology risk, even if the product technology itself is proven and has value.
- *Lack of sufficient product support in the marketplace.* A new offering can have tremendous value, but sufficient customer service infrastructure in the marketplace must exist as well.

This line of thinking can lead an Impact Investor to prefer investing via a specialized Private Equity Fund that is focused across a number of different market segments in order to achieve diversification benefits within the Fund itself. Here are four facts that suggest the type of Fund in which the Impact Investor might choose to invest:

- *Fact #1: Younger funds tend to outperform older funds.* (Note that younger funds are usually also smaller funds and usually more focused funds in light of their limited capital.) According to Preqin, 36% of first-time funds ranked in the top performance quartile, while a further 22% were in the second quartile (58% in the top half).²⁵ This is attributed, in part, to smaller, younger fund managers being "hungrier" and more entrepreneurial than larger "satisfied" fund managers. These newer firms are typically drawing lower management fees in aggregate, and their historical investments may be unrealized and illiquid, meaning that the investment team is more tied to the success of the fund.
- *Fact #2: Smaller investment funds tend to outperform larger funds.* Exhibit 9 above demonstrates that smaller private equity funds significantly outperform larger funds. This is attributed, in part, to their increased ability to generate and win deal flow (many deals are directly sourced from founder/entrepreneurs and are "unbanked," meaning intermediaries are not running competitive processes, and, therefore, likely to have fewer bidders). In addition, the lower end of the market is less efficient, thereby creating more opportunities to invest at lower valuations in more attractive

²⁵ Preqin, "Emerging PE Managers Make an Impact with Prime Performance," Press Release, September 16, 2011.

situations. Smaller companies benefit enormously from operational adjustments and professional management teams, and there are more exit opportunities available to smaller companies (to larger investors, strategic buyers, or a possible IPO, whereas larger investments can typically be exited only through a strategic sale or IPO). FLAG Capital has published data demonstrating diminishing returns with growing fund size, as proven smaller managers raise progressively larger funds and, due in part to style drift, allow their returns to shrink.²⁶

- *Fact #3: Strategy-driven funds tend to outperform opportunistic funds.* Strategy-driven funds, such as theme investors, tend to be more disciplined in their investment strategy and define risk tolerances more tightly than is typically true for broad-ranging opportunistic funds. A major contributor to progressive fund performance declines is strategy or style drift. While little work has been done in private equity, mutual fund data shows that more style-consistent funds significantly outperform less style-consistent funds on a risk-adjusted basis.²⁷ What were previously strategy-driven funds may turn into more opportunistic investment vehicles over time with continuing style drift. To the extent that style drift materially departs from the original conceived investment strategy, returns have typically declined.
- *Fact #4: Sector funds tend to outperform generalist funds.* Sector funds (environmental, biotechnology, software, etc.) benefit from deep expertise and knowledge of their sector, deal sources, financing sources, regulatory environments, prospective management candidates, and possible exit opportunities. Sector specialists understand sector value drivers and how to leverage them, competitive positioning, how CapEx and OpEx should be balanced, the natural rhythm of companies in their target sectors, and how long it should take to achieve company performance improvements, and can, therefore, diligence opportunities more deeply and efficiently. Investors with such sector expertise are inevitably more helpful to a portfolio company than a less-involved generalist, and, therefore, more able to share responsibility for building company value. As the profile of private company investing has transitioned from debt-dependent LBOs to more operational value creation, sector specialists are necessary to help find and create this value.²⁸

The question of relative risk of impact investing vs. more conventional private equity investing remains. Clearly, the earlier stage of the investment the more the uncertainty, but also the greater the opportunity to achieve an upside outcome, as many earlier stage companies feature industry disruptive products and should grow faster than more mature companies in markets where growth may be slowing and competition increasing. The early mover has some important advantages but they come with additional investment risk. This argument supports the case for investing via a specialized private equity fund, in order to get the diversity value of a larger portfolio of investments.

4. Role of Private Enterprise in Impact Investing

²⁶ FLAG Capital Management, LLC, “Making Sense of the Lower Middle Market,” *Insights*, April 2012.

²⁷ Keith C. Brown, W. Van Harlow, and Hanjiang Zhang, “Staying the Course: The Role of Investment Style Consistency in the Performance of Mutual Funds,” Working Paper, April 2009.

²⁸ For additional information on thematic investing, see Vincent Bérubé, Sacha Ghai, and Jonathan Tétrault, “From indices to insights: How thematic investing can deliver,” McKinsey & Co., n.d.

The plain fact is that social or impact capital alone is usually insufficient in scale and consistency to have significant sustaining impact on most public problems (certainly environmental problems). Social capital can be found in many places but tends to be fairly small in scale, particularly when compared against the scale of capital needed to solve a major environmental problem. Impact Investors are likely to have to rely primarily on collaborative investment structures for the foreseeable future—either explicit or informal/implicit—between like-minded funding sources to mass enough intelligence and resources to generate real impact on the problems in question.

Entrepreneurs who launch private market environmental companies (attacker companies) into competitive traditional “dirty” markets are probably the most important way to disrupt an industry and over time change the industry’s practices toward more service to a Population of Need. However, this must be done with full understanding of the capital requirements and risks associated with such a launch. Relatively few such companies end up as investment successes, in light of market resistance and the capital advantages of the entrenched competitor set. There is an obvious need for more private impact capital to support these entrepreneurs.

The authors acknowledge that a growing number of public and private corporations are beginning to act more responsibly toward the environment as they recognize economic benefits of resource efficiency and the brand value of more responsible environmental behavior. However, to date, corporations have contributed far more to the problems than they have to the solutions—and occasionally “green wash” their environmental commitments to protect their brand. Corporations today are still motivated to take advantage of the short-term bias, externality opportunities, and problems of the commons. It is the role of Impact Investors and other stakeholders to pressure these corporations toward better environmental management.

As noted, government funding, although welcome, is insufficient in scale and consistency and heavily subject to influence by special interests, usually in protected markets. Public-private partnerships (such as New York State’s Green Bank), while increasing in frequency and offering significant long-term promise, are still at a nascent stage and, because of politics and lack of understanding of solution requirements, usually undercapitalize the solution and falsely expect the new solution enterprise to stand on its own in just a few years. Nonetheless, linking Impact Investing to public-private partnerships is a promising area that should be supported by Impact Investors.

Private and public third party asset managers have an important role to play in marshalling capital to solve these problems. As fiduciaries for private individuals, government employees and sources of philanthropic capital, these asset managers control enormous amounts of wealth. They could use more of this wealth to invest with private investment firms committed to ameliorating these problems through active investment into companies producing environmental products or services, or in public companies that commit to doing the right thing with respect to resource efficiency and environmental management.^{29,30} Understandably, however, these asset

²⁹ A group of 17 foundations that control nearly \$1.8 billion in assets have recently united to sell off their investment interests in companies in the fossil fuel industry. In addition to the foundations, 22 cities, 20 religious organizations, nine colleges and universities and a number of other institutions has agreed to exit investments in fossil fuel companies. The John Merck Fund, which is 97% divested of fossil fuel, was up roughly 20% last year. As reported in Diane Cardwell, “Foundations Band Together to Get Rid of Fossil Fuel Investments,” *New York Times*, January 29, 2014.

³⁰ FirstEnergy Corp., one of the nation’s largest electric utilities, has recently agreed to reduce its carbon emissions in response to pressure from shareholders, including the New York State Common Fund and the Connecticut Retirement Plans and Trust Funds.

managers must believe that they are going to receive a competitive return on their investment and they properly view their fiduciary duty as requiring that. It is up to the Impact community to demonstrate that high economic returns can be earned and to educate managers of large asset holders to that effect.

5. The Essential Need for “Show-the-Way” Investing and Broadening the Solution by Attracting Additional Capital

Many investors are risk averse and tend to wait for other investors to take the first step before they consider deploying their capital, particularly with a newer company that features a disruptive product or service. This tentativeness means that impact investments, to the extent they are made, often come later and are smaller than needed.

Impact Investors, almost by definition, need to be willing to take an early step in investing in a promising target company, since the company may be early in its development and a member of an emerging, not-fully-proven industry. Growing companies most in need of capital to scale their businesses need significant amounts of capital and need it before they are fully established as legitimate players. True impact capital cannot afford to watch from the sidelines.

Timely, “show-the-way” investing is crucial, especially at the early growth stage of a company’s development, where significant capital may be needed to fully commercialize a growth business, and initial, well-regarded early investors can help draw in larger, more traditional and perhaps less-impact-minded capital sources as the company develops. The benefit of drawing later non-impact capital is that these sources are typically writers of larger checks. Once the first substantial investment has been made, the likelihood of other investors following increases significantly. The early money, if Impact Investors are willing to work to help bring in enough capital, should lead to outsized impact.

Impact Investors should go into any investment having worked through a plan to avoid the problem of chronically underfunding Impact Investments. Many such investments turn out to be funded barely to the next development stage and then may starve for capital, thus putting the entire enterprise at risk. It is obviously best to fund the enterprise to full, confident completion with positive and growing cash flow. However, if that is not possible, the authors still recommend reserving capital for an extended follow-on fund raising period and identifying and involving the next round prospective investors as soon as practicable. It is usually prudent to raise up to twice as much capital as the company thinks it will need for its next stage of development and then keep the “surplus” in reserve to be invested at the option of the investors.

6. The Essential Need for Collaboration in Impact Investing

Investors committed to impact should be concerned both with working in concert with other Impact Investors to build coalitions and clubs and with unlocking and appropriately directing institutional and industrial capital into clean economy markets.

Today’s impact investing community is relatively small and early in its development, and requires extensive capital to bring attacker businesses that are improving resource use and environmental sustainability to full commercial scale. Otherwise, these businesses run the risk

FirstEnergy operates in six states, principally in the Northeast. The Company agreed to this new program in light of the risk that climate change poses to its long-term profitability.

of being stuck small without the ability to drive down unit production costs through achieving commercial scale, develop a growing position in their distribution channels, or command capital from the capital markets at competitive rates. Such businesses often fail for lack of time to prove themselves, despite having valid, high-value products that produce high economic value to the end customer. Small, uncoordinated investment strategies are unlikely to have a lasting impact on a gnarly environmental problem. This is a central challenge of impact investing into disruptive companies.

Early investment coalitions to support the growth of an attacker company in the environmental field not only increase the likelihood of success for the early stage company as it reaches for profitable growth but also can form a legitimizing cohort from which to expand as more capital is needed in the future in an effort to revolutionize a dirty industry. Little coalitions can become bigger coalitions and ultimately involve institutional sources of capital, thus giving the company credibility as it expands in its distribution channel or elects to provide customer financing to convert a customer capital cost into a more acceptable operating cost.

Once a clean economy attacker company has been established as valid and is following a winning growth formula, additional capital is usually necessary to support further business scaling and begin change its underlying industry. (Moving the compression-based, energy-inefficient commercial air conditioning industry over to compressionless, energy-efficient practices is an example of a desired industry transformation.)

Without substantial capital sources (including family offices, foundations, large private equity firms, public and private pensions, endowments, insurance companies, and other such investors) ultimately investing in environmental opportunities, there is little real prospect of overcoming the many difficult environmental and resource challenges. Corporate practices are simply too well established to yield to a threatening good idea, particularly in the world of Quarterly Capitalism.

Consequently, coalition building and pooling of resources is essential to having a reasonable prospect of achieving a sustainable impact on an environmental problem, even if only addressing a successful demonstration project. This can be done directly by forming an investment club of impact investors, perhaps with separate governance, or investing with a private equity or venture firm that has a highly articulated strategy consistent with the strategy and values of the Impact Investor. It can also be done by counterprogramming the investment strategies of other Impact Investors, so as to supplement the impact of these other investors without formally collaborating with them (in effect, an “implicit collaboration”).

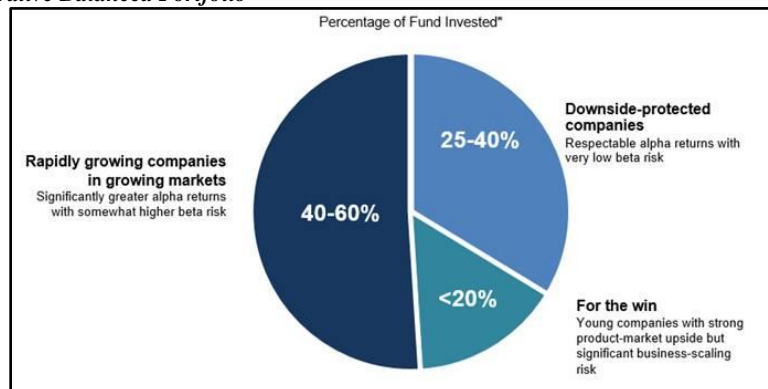
These investment clubs and investment firms can provide the necessary “show-the-way” capital to draw the initial capital resources into a business and, by extension, ultimately into a broader market. Coalitions may take the form of raising funds to attract institutional investors, and/or actively lobbying pension funds, foundations and endowments to more consciously invest their capital. In this way, Impact Investors may be able to attract a sufficient scale of capital to create a truly sustainable impact. Impact Investors might consider taking a portion of their returns from successful investments and using them to fund efforts to coopt such sources of institutional capital.

7. A Balanced Program to Restore the Investor’s Fund Corpus

Asset allocation is central to sensible asset management, no matter what the purpose of investing, and is particularly important for an individual or institution that seeks to balance a program of investing for economic returns with investing for impact. Put simply, an Impact Investor needs economic returns in order to refresh his/her pool of investable capital so as to continue the Impact Investment program over a long period of time. In addition, the investor needs to protect against market downcycles and other *beta* risk with a portfolio that is diversified across industry segments and among investment stages that are driven by a range of uncorrelated value factors and risk factors.

Within the growth capital spectrum, the authors reject the concept of a “typical deal” and, as noted earlier, favor a portfolio ratio of 60%, 25% and 15% (as set out in Figure 10), with roughly 60% of portfolio funds going into *growing companies in growing markets*, 25% of portfolio funds going into more *downside-protected investments* (such as a company seeking capital to finance light infrastructure projects), and 15% of portfolio funds going into *high optionality investments* with strongly disruptive products that may face significant business scaling challenges (“*for the win*” but with no technology risk). The authors consider this diversified approach to be a *balanced, low correlation portfolio*.

Figure 10: Illustrative Balanced Portfolio



Source: NewWorld.

A balanced portfolio in an appropriately diversified and impactful sector should mitigate any need for tradeoff between economic returns and societal benefits. The environmental opportunities sector, by example, has high economic opportunity market segments that bring with them significant, measurable “free rider” societal co-benefits, such as less energy use, cleaner energy use, improved water resource management, and more effective approaches to waste management.

A balanced portfolio approach should allow the Impact Investor to significantly increase the likelihood of capital recovery and capital growth. In the authors’ opinion, it is imperative to direct a material portion of impact investment to opportunities that are further developed and less risky in order to help ensure the returns necessary to refresh the impact investor’s pool of investable capital, as well as to have resources to provide additional growth capital to companies that are providing impactful products and services.

In the authors' view, an investor should not focus exclusively on the venture/new idea/new technology end of the business system, as technology and market adoption risk can vaporize expected returns and leave the investor with what amounts to an unintended "spend down" strategy of his or her capital.

8. Performance of Impact Investing as an Asset Class

While much private company impact investing still lacks an auditable track record, Impact Investing in the public equities market has generally outperformed the non-impact market in returns over the market cycle, as shown in Figure 11 below.

Figure 11: Relative Investment Performance



Reproduced from Augustin Landier, Vinay B. Nair, "Investing for Change: Profit from Responsible Investment (Oxford University Press, 2009). As described in Mark Fulton, Bruce M. Kahn, Camilla Sharples, *Sustainable Investing: Establishing Long-Term Value and Performance*, DB Climate Change Advisors, June 2012.

One explanation for this phenomenon is that companies concerned about their resource use and seeking to use resources more efficiently are inherently more capital-efficient, and, therefore, tend to produce better returns for their investors. Private companies that both use resources efficiently and produce products/services that encourage this kind of capital-efficient behavior (within customer companies) should be well-positioned to exceed the above-reported public company returns. Another possible explanation is that these impact investments are often in "attacker" companies with innovative, high-value products and, in many cases, superior, more motivated, entrepreneurial management teams.³¹

As discussed earlier, economic performance in Impact Investing is influenced both by the choice of investment sector (does it offer attractive fundamentals such as a growing market, less competitive intensity, a basis for sustainable product differentiation, strong Economic Value to the Customer?) and the choice of investment strategy (is it investing in growth segments and the right stage of business development with sustainable differentiation in its products and

³¹ The authors know of no proof to support this assertion but the superior investment results suggest strongly that some favorable force is at work that leads to improved investment results compared to standard "vanilla" investing.

appropriate risk mitigation and diversification?). As with any successful investment strategy, if a comprehensive industry and Business System analysis is applied to impact investments, the result is more likely to be strong, market-competitive returns.

* * *

Since long-term thinking is essential for long-term success, the question is how to make Impact Investing ever more powerful as an agent of change over time. Aside from increasing the effectiveness and consistency of Impact Investing by individuals, family offices and certain foundations, the authors believe it is essential for Impact Investors to bring ever larger amounts of capital to support clean economy growth companies. Investing in these companies at the needed stage should, over time, help draw larger, non-impact-oriented investment sector capital from large capital providers (large private equity firms, corporations, pension funds, endowments, and governments) into the sector and ultimately perhaps to stimulate more intelligence and courage in government policy and regulation.

Influencing how capital moves may well be the most impactful way to effect change in market behavior toward societal betterment. Financial markets drive or inhibit change in America. Today, these markets support wasteful and dirty business practices and deeply grooved business behaviors that are often anti-innovative for reasons discussed in this memorandum. Moving these financial markets away from supporting inefficient behavior toward more sustainable practices is essential if the nation is to transition toward a clean economy. In the authors' opinion, the best way to do so is to prove that private capital can earn market returns by investing in clean economy businesses and business practices.

Consequently, it is essential to demonstrate that private capital that has a wide range of investment choices and wants a competitive market return can thrive in environmental markets. Since environmental problems typically require relatively large amounts of capital committed over longer periods of time, their solution surely requires that the private capital markets become responsive to these opportunities. Social capital and government capital and/or regulation alone will not produce the desired outcome (they have failed to do so in the past). Impact investors simply must build a provable case that private capital can flow productively into environmental problems and earn a competitive risk-adjusted return.

There are some signs of growing awareness of environmental issues on the part of leadership of publicly-held corporations. A recent McKinsey study of nearly 2,000 executives reported that more than 75% believe that ESG initiatives create corporate value over the long run. However, few corporate leaders reported thinking that ESG initiatives add corporate value in the near term and they consistently point to the short-term orientation of frowning financial markets as the

culprit.³² At least corporate leadership is beginning to talk the talk and a few corporate leaders may be beginning to walk it as well.³³

In order for an Impact Investing perspective to become truly impactful and sustainable, it will ultimately be necessary for large public company security holders, notably large pension funds and endowments, to develop a new sense of responsibility to their beneficiaries, namely retired individuals and endowment donors, and to take a broader view of corporate performance to include proper behavior in service to other stakeholders, externalities and the full range of ESG matters. Impact Investing has an important role to play in encouraging large asset managers in the needed direction.

In addition, Impact Investors should seek ways of influencing the Securities and Exchange Commission to tighten and enforce its public company reporting requirements on climate risk, which to date has been a weak initiative. Nearly three-quarters of the nation's publicly-traded companies are ignoring a three-year-old SEC requirement that they inform investors of the risks that climate change may pose to their bottom lines.³⁴ This is yet another example of weak regulatory standards and weak enforcement by government.

The authors believe in the existence of the *Virtuous Quadrant* of high economic returns and high societal co-benefits from certain investment strategies, particularly strategies focused on inefficient sectors of the U.S. economy such as the management of increasingly scarce resources and the consequent opportunity to reduce energy and water use and the pollution byproducts of excessive energy and water use. We reject the assumption of a necessary tradeoff in economic returns in order to achieve societal benefits. We see potential in the middle- and lower-middle markets in the United States and Canada, which suggests an opportunity for extra-normal economic returns while in parallel achieving significant environmental benefits. There are new, growing markets here and smart investors should take advantage of these opportunities.

³² Back in the 1970s, the average holding period for U.S. equities was about seven years. Today, it is more like seven months, thus supporting the short-term fetish in corporate management and contributing to increased volatility in public equity markets. Source: McKinsey & Company.

³³ A 2011 trust barometer survey found that trust in U.S. business was only 45% (much lower than in many nations), which gives U.S. corporate management a strong incentive to modify behavior in favor of earning more trust with the purchasing and investing publics. Source: Edelman 2011 Trust Barometer.

³⁴ Of the 1,050 businesses that acknowledged climate change in their 2012 Annual Reports, few disclosed real specifics. About 70 percent of these companies mentioned that their operating costs might be affected by existing and pending rules limiting carbon dioxide emissions, such as EPA's greenhouse-gas regulations. Far fewer discussed how their businesses would be financially affected by the physical impacts of global warming. Source: Annual reports of 3,895 U.S. public companies listed on major stock exchanges.

NEWWORLD'S INSTITUTIONAL PERSPECTIVE

NewWorld believes that the American economy is at the threshold of a major secular transformation that will move industrial practices toward cleaner and more efficient and sustainable practices. The motive forces behind this transformation are changing market demands, changing business economics, and growing shortages of many natural resources.

The current development path in the United States and the world at large is characterized by inefficient energy use, primary reliance on hydrocarbon energy, rising and volatile energy prices, heavy dependence on rapidly depleting resources, inefficient and aging resource infrastructure, and high levels of pollution. This rising reality is properly seen as unsustainable by scientists, economists, and a growing number of public officials, business leaders, and other opinion leaders.

These trends are beginning to pose difficult challenges for corporations: problems of product cost, customer value, business competitiveness, and by-product effects on society, aggravated by growing pressure from constituencies. These challenges are leading, in turn, to broader issues involving capital productivity, competitive best practice, standardized business practices across differing geographic markets, competitiveness in the global marketplace, offshore job loss, economic growth, and quality of life issues for the nation's citizens—especially when viewed against more rapidly growing nations in an increasingly competitive world. Other countries, notably China, are seen as leading—and, indeed, widening their lead—in products and services that serve the energy and environmental markets. America's competitiveness in these markets is slipping.

In NewWorld's judgment, the American economy has commenced the transition toward more energy-efficient practices and alternative forms of energy. The economy is beginning to limit consumption of finite resources and commodities by re-pricing resources, becoming more resource-efficient, and substituting renewable resources where possible. The economy is developing more cost-effective approaches to reducing and eliminating pollution of the air, water, and land. And the economy is beginning to protect, allocate, and regenerate limited freshwater supplies and to control and recycle the rising tide of waste. Eventually, the economy and our broader society must acknowledge the challenge of greenhouse-gas emissions and begin the journey toward a low-carbon economy. NewWorld sees significant investment opportunities now and in the years ahead arising from these trends.

NewWorld believes that many of the technologies and business approaches needed to address these challenges exist today and that others will continue to be developed—and *that this secular industrial transformation will gather force in the years immediately ahead*. NewWorld believes that this transformation will require large amounts of private capital, as government lacks the mandate and resources to provide the needed funding.

Against this background, NewWorld sees a new class of fast-growing “attacker” companies emerging in the United States and elsewhere that are offering innovative, competitive products and services aimed at the energy and environmental markets. However, many such companies are in particular need of capital and management assistance to fuel their development and become a significant presence in their markets. NewWorld believes these mid-size and smaller attacker companies offer special promise.

The NewWorld Team believes it can profitably deploy capital to provide investors with superior economic returns derived from companies participating in, furthering, and benefiting from this historic transition. We see no need to trade off attractive investment returns in order to produce co-benefits for society since many opportunities exist to produce market rate returns coincident with such benefits. Accordingly, NewWorld operates as a single bottom-line investor with a commitment to maximize returns in the course of its investing and business-building activities.

NewWorld seeks to partner with talented management teams to build and grow their businesses, engaging them with mutual respect and sharing in their success. The Firm is committed to the highest standards of integrity, fairness, and excellence in fulfilling its stated mission and seeks to be a leader in its field.

This essay was prepared by Carter Bales and Silda Wall Spitzer of NewWorld Capital Group, LLC.

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Profit in Moving Toward a Clean Economy

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