

2009

Advanced Investment Partners, LLC

April 2009



[MAKING SOCIALLY-RESPONSIBLE SUSTAINABLE]

In the autumn of 2004, an existing client asked us to create a socially-responsible investment strategy. We emulated the basic strategies offered by many: simple negative screening of industry groups such as alcohol, tobacco, military/defense, pornography, and nuclear. Subsequently, the "Socially Responsible" genre has changed. The increased attention to global warming and the renewed vigor with which shareholders monitor and assess corporate Boards, coupled with a proliferation of quantitative indicators to assess environmental, social and governance issues, led us to enhance our Socially Responsible LargeCap strategy. This paper details the changes which led to our improved Sustainable, Responsible LargeCap strategy.

If it Ain't Broke...

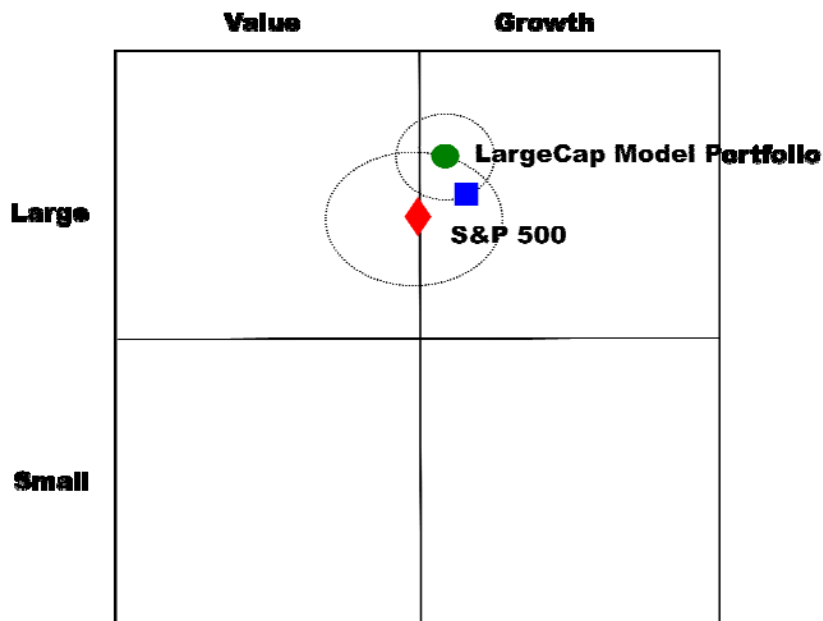
AIP's First Generation SRI Strategy

We had originally been asked to step into the place of an underperforming Socially Responsible Investment (SRI) manager. The client believed our stock selection methodology and history of designing proper portfolio management guidelines made us a good candidate to design an SRI strategy.

We began researching and discussing the best way to create this new strategy. We understood the existing mandate necessitated the exclusion of Alcohol, Gaming, Military/Defense, Nuclear, and Tobacco. We contacted [KLD Research and Analytics](#) and began subscribing to their database. This gave us the ability to incorporate negative screening into the portfolio construction process.

We also incorporated a methodology we'd successfully used in our Tax-Managed strategies: Dual Benchmark Implementation. ITGOpt allows us to include both a primary and secondary benchmark in the optimization function. We wanted our new Socially-Responsible LargeCap (SRL) strategy to maintain a similar active risk (3.5% to 4.5%) to the S&P 500 Index® as our flagship LargeCap strategy. With the exception of the aforementioned industry restrictions, all other portfolio guidelines for the SRL strategy were consistent with the flagship LargeCap; we wanted this new strategy to offer our clients a true core large-cap portfolio which could be used as a core strategy in a core/satellite approach, rather than as a supplemental allocation (i.e. a satellite).

Additionally, we wanted the SRL strategy to emulate the characteristics of our flagship LargeCap strategy. We accomplished this via the use of the LargeCap model portfolio as a secondary benchmark. Here, we targeted a tracking error versus the LargeCap model of 1.0 – 1.5%. This ensured greater consistency of the two strategies.



The Next Step

The next step in the evolution of the strategy was a divestment and restriction from purchasing/holding companies doing business with the Sudan, which we implemented in mid-

2007. This was truly the first values-based judgment we originated in the investment process.

Why? According to www.SudanDivestment.org,

“Since 2003, the government of Sudan has pursued a genocidal campaign against the civilian population of Darfur. Although governmental obstruction has prevented the international community from obtaining concrete statistics on mortality, hundreds of thousands have died and over 2.5 million have been displaced as a result of the conflict. The United States government first labeled the Darfur conflict as genocide in July 2004. This is the first time the U.S. has declared a situation to be genocide while atrocities are ongoing.”

When we implemented this restriction, eight members of the S&P 500 Index® were flagged by KLD as having involvement with Sudan. Today, only three of the original eight are restricted. Effectively, the other five have been pressured into severing all passive ties with the Sudanese government.

It’s important to note that in addition to doing *good*, we are aiming to do *well*. A [study](#) of the performance of the Highest Offenders in Sudan showed significant underperformance versus their peers.

At this point, we’d only dipped our toe into the water in terms of adopting a more comprehensive approach to responsible investing. Why would we consider further changing the Socially-Responsible LargeCap strategy which has topped the S&P 500 by 1.48% over its first four years? The short answer is that there is a building distrust of corporate governance, increased concern about the environment, and increased demand for workplace diversity and opportunity. These societal trends in part manifested themselves in the US elections of 2008. Policy change dealing with these issues is in process. This trend is also seen in the asset flows into SRI, both through public and private vehicles. We’ve also seen corporations including climate change in their business plans and acknowledging the business risk of not ensuring where their labor is sourced. Whether one believes in climate change or not, SRI has what Charlie Munger calls a “Lollapalooza effect” – several influences converging to form a powerful outcome.

Researching the Landscape

The first step in improving the Socially Responsible LargeCap was a thorough survey of the Socially Responsible landscape. This survey included researching industry trends, competitive offerings, and environmental, social and governance (ESG) research/data providers. This also meant a review of the legal environment.

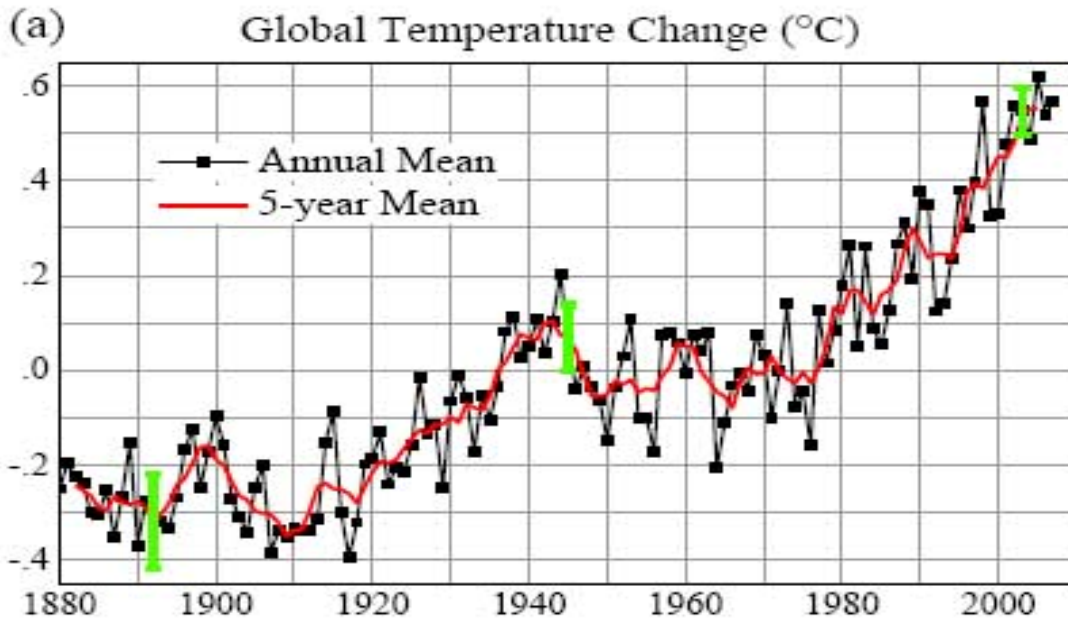
Is Climate Change Real?

Climate change has exploded onto the world’s collective conscience. Whether it’s filling up our gas tank, watching the six o’clock news or the latest Hollywood blockbuster, or listening to the Presidential debates, we are constantly reminded of climate change. Some investors are interested in saving the planet, others in protecting our national interests or supporting their religious beliefs, and still others are driven solely by the interest of profiting from a powerful investment trend. Regardless of the individual reasons, Sustainable and Responsible Investing (SRI) is here to stay.

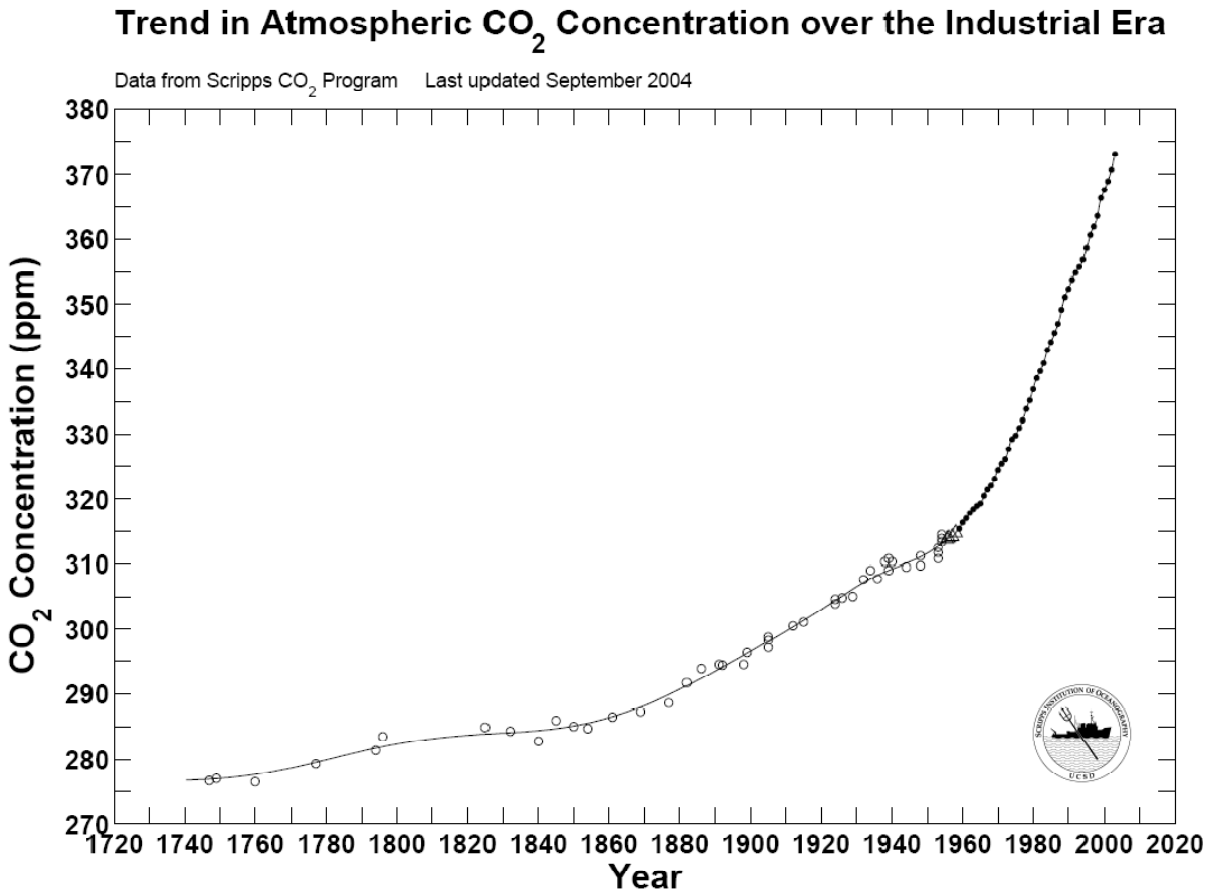
Climate Change Is Real, but don’t believe the Hype

Admit it. You’ve walked outside on a hot summer day and have thought to yourself, or perhaps remarked to a friend, “Boy, it’s so hot out - I wonder if this is what global warming feels like?” Then, of course, you snapped back to your senses and went on with your life. You can believe that this has happened to most everyone I work with here in Safety Harbor, Florida.

While it's unlikely that any of us can discern the effects of global warming on a daily basis, on a cumulative basis, scientists do indeed observe global warming. In fact, according to NASA, 2007 was the second warmest year on record. Eight of the past ten individual years are among the ten warmest single years on record (chart a). And the concentration of CO₂ in the atmosphere began to increase more rapidly at the dawn of the industrial revolution, and has gone hyperbolic since 1970 (chart b) according to the Scripps CO₂ program.



Source: Goddard Institute for Space Studies



In fact, we in Florida have several reasons to be particularly concerned about climate change. Those of us who aren't natives settled here because of the tropical climate. Among our concerns:

- Mangroves are disappearing rapidly (20% of the world's mangroves since 1980)ⁱ
- Coral reefs are decaying due to temperature increase and acidificationⁱⁱ
- If ocean levels rise significantly, Florida will be adversely impacted
- Hurricane frequency and intensity is of particular concern to Florida
- Seven of the nine costliest Atlantic hurricanes on record have occurred since 2004ⁱⁱⁱ
- Heat stress, insect-borne disease, increase in skin cancer occurrence

But while climate change is real, it's also wildly overhyped. Time Magazine[®]'s famous 2006 feature on global warming featured the photo of a polar bear floating aimlessly on a piece of ice, searching in vain for the polar ice cap. In his book "Cool It", Bjorn Lomborg (widely regarded as one of the world's preeminent experts on climate change) notes that of 20 global polar bear subpopulations, only one or two are in decline, 2 are increasing, and the rest are stable. In fact, while the Time[®] story claims 15 bears die each year due to the effects of global warming, Lomborg notes that 49 die each year due to hunting!

Sea level rise due to ice melt is a myth – ice already displaces water. Sea level rises because water expands as it warms, and due to run-off from land based glaciers. Glacial run-off

contributes about 60% of the rise, expansion 40%^{iv}. The UN expects that sea levels will rise about 1 foot over the course of this century – the same rise as we've experienced since 1860^v. Even if we did nothing about global warming, more and more people will be subject to flooding due to massive population increases on the coastlines (Florida coastline population grew 50x versus US population growth of 4x) and sinking cities (Santa Clara, CA sank 4 yards from 1920-1970 due to water usage)^{vi, vii}.

Do SRI/ESG Strategies Create Change?

The ESG movement is powerful indeed. While the US lags Europe in fully embracing ESG, the [United Nations' Principles for Responsible Investment](#) (UNPRI) was created in 2005. The Principles, which are a voluntary framework for considering Environmental, Social and Governance issues while making fiduciary decisions, have been adopted by well over 200 of the world's largest institutional investors. In aggregate, these investors wield tremendous influence over the corporate world.

In and of themselves, PRI Signatories such as TIAA-CREF and CalPERS are at the vanguard of shareholder activism. CalPERS [governance program](#) has targeted a number of companies for [reform](#). TIAA-CREF was an early mover in the realm of corporate activism, and [continues to influence companies](#) to adopt strategies for long-term success.

There have been published [studies](#) linking this activism to stock prices.^{viii} The worst performing companies in terms of ESG criteria tend to be undervalued relative to their peers. This not only raises the cost of capital for these companies, but also hits the corporate managers where it hurts. These managers are often compensated with company stock, and so are acutely aware of the impact poor corporate responsibility can have on their purse or wallet.

Many business risks are related to climate change. Companies must concern themselves with not only their production's susceptibility to increased fossil fuel/raw materials costs, but also their supply chain's susceptibility^{ix}. Many companies are susceptible to sudden regulatory changes to cap greenhouse gas emissions, and could be susceptible to litigation if they do not subsequently curb emissions. In today's interconnected world, even a company's reputation can be viewed as a business risk (recall the response when reporters uncovered Nike's child labor factories). More recently, Walmart has been criticized for poor labor relations and work conditions, and more than one large institution elected to sell its holding in Walmart due to their lack of timely response to these problems. The risks are real and evolving, as is the response of the investment community.

There has been substantial corporate progress in the US, including, but not limited to, Chevron's integration of renewable technologies into its energy portfolio, Ford & GM's plans to increase hybrid vehicle production tenfold, to 250,000 annually, by 2010, American Electric Power building the first commercial-scale power plant using coal gasification technology, and General Electric's "ecoimagination" campaign, a plan to double investments in climate-friendly technologies and reach \$20 billion in annual sales by 2010^x.

Industry Trends

Sustainable, Responsible Investing has evolved tremendously over the past 100+ years, and the pace of change has only accelerated. Rather than simple mission-based negative screening for industries such as alcohol, gaming, tobacco and firearms, Sustainable Investing now includes issues such as climate change, alternative energy, carbon emissions, community development, economic fairness, corporate governance, and ideological and religious investing.

Assets flowing to such strategies are surging. The global SRI market stood at more than \$5T in 2006. At the same time, \$2.7 Trillion - 11% of all AUM in the U.S. - is involved in SRI. From 2005 – 2007, SRI assets increased over 18%, while all professionally managed assets increased less than 3%. Institutional SRI mandates soared 27% during the same period, from \$1.49T to \$1.88T.^{xi} Investment Banks such as Goldman Sachs and JP Morgan are choosing to buy companies outright rather than take them public and collect underwriting fees. Hedge funds such as DE Shaw and SAC Capital have made significant investments.

Notable individuals investing in the space include:

- Warren Buffett, CEO of Berkshire Hathaway, which owns MidAmerican Energy, the nation's leading utility in wind energy. It has invested \$385 million to build wind-power plants.
- At GE, CEO Jeff Immelt is betting that green technology will fuel the next century of growth. GE sold \$10 billion worth of clean-energy gear last year and plans to put \$3 billion into clean-energy ventures by 2008.
- Cascade Investments, the investment arm of Microsoft Chairman Bill Gates, has invested in Pacific Ethanol, a public company that is building an ethanol plant in California.
- Virgin Group CEO Richard Branson plans to invest up to \$400 million in a biofuel plant. He is also investing in wind power and trains that run on biodiesel.
- Vinod Khosla, co-founder of Sun Microsystems, is a biofuels evangelist. In the latest of a string of ethanol deals, Khosla Ventures and other investors are plowing \$50 million into ethanol startup Altra.
- Google co-founders Larry Page and Sergey Brin have invested in Palo Alto solar-energy startup NanoSolar.

We believe the next phase will be ESG as a source of value-added. Not only in terms of hastening increased corporate responsibility, but also as an element determining flow of investor capital. We know large institutions are going to reduce positions in “bad actors”, and will likely increase positions in more responsible companies. Of course, these companies must show the economic traits which have always been desirable, but now we have a new element influencing investment flows.

Data Providers

A problem for a broader application of SRI has been the dearth of measurable data. Over the past few years, however, quantitative data in the SRI space is improving exponentially. The Enhanced Analytics Initiative (EAI) was established by a group of asset owners and fund managers to promote better broker or sell-side research on extra-financial issues. Many private firms now offer high quality data known as Key Performance Indicators. The indicators cover environmental, economic, social, and governance issues in a reliable, repeatable manner.

Since the strategy's inception in 2004, we have relied on KLD to provide us with the aforementioned industry and country screens. As we looked to evolve and improve our offering via the inclusion of positive ESG scores, we established a partnership with ASSET4[®], a Swiss firm founded in 2003 which spans the globe with ESG research covering over 2,500 companies. ASSET4[®]'s database offers hundreds of customizable metrics with the ability to drill into supporting documentation to allow for complete transparency. This allows us to evolve from a

“plain-vanilla” socially-responsible strategy (read – simple exclusion of certain industries) to a set of more customized sustainable and responsible investment (SRI) strategies.

ESG Community

The ESG community encompasses asset managers, consultants, plan sponsors, and activist groups. The individuals are too vast to name, but one organization we should highlight is the [Social Investment Forum](#).

The Social Investment Forum (SIF) is a nonprofit organization with over 500 member organizations. The organization is dedicated to advancing the practice and growth of socially-responsible investing via consideration of environmental, social and governance issues. This community is very active, with a web and e-mail-based forum used to share ESG news and views. SIF sponsors a [yearly summit](#) of ESG practitioners, conducts a media campaign to raise awareness of ESG issues, generates proprietary topical research, and has several working groups.

Fiduciary considerations

A recent study of leading pension funds notes that clarification by legislature as to whether or not sustainability goals need to be taken into account by the pension fund is desirable for the legal certainty with respect to fiduciary duty^{xii}. The long-running concern is whether SRI strategies generate inferior returns. However, studies refute this notion (see below “Investment Process – Economic Rationale” below for details). Further The Responsible Investor Landscape 2008 Asset Owners survey shows 47% of investors already committed to responsible investment strategy said their choice had made a positive impact on investment returns, while 43% said it was too early to say.

A fundamental truth is that pensions have a long investment horizon, consistent with SRI. Beneficiaries have a strong interest in being able to live out their retirement in an intact environment and a peaceful world. To this point, the “Freshfields Report” (A Legal Framework for the Integration of Environmental, Social and Governance Issues into institutional investment – October 2005) clears the way for SRI considerations. In fact, according to this report, where beneficiaries have expressed investment preferences toward SRI, these preferences should be taken into account.

Finally, sustainability reporting requirements for Florida Plans are already being increased. Florida Treasury is beginning a formal analysis of its investments for the financial implications of climate change. They’ve launched a semi-annual review to assess how public fund managers incorporate climate risk in portfolio holdings as part of prudent investment management. Similar developments have occurred across the US.

Investment Process

Economic Rationale

“[Demystifying Responsible Investment Performance](#)”, a Mercer Consulting and UNEPFI review of 20 academic studies reveals only 3 show a negative relationship between ESG factors and portfolio performance. The same study details a review of 10 brokerage reports which reveals

none show a negative relationship between ESG factors and portfolio performance. Further evidence that SRI assets have increasing and significant impact on stock returns is contained in a [2007 working paper](#) from the Federal Reserve Bank of Atlanta^{xiii}. [Watson Wyatt](#) and [Russell](#) have also issued supportive studies^{xivxv}.

Philip Fisher, considered by many to be the pre-eminent Growth investor (including Warren Buffet, who credits Fisher with being second to Benjamin Graham as an influence), listed “Fifteen Points to Look for in a Common Stock”^{xvi}. Among these:

- Point 7: Does the company have outstanding labor and personnel relations?
- Point 8: Does the company have outstanding executive relations?
- Point 9: Does the company have depth to its management?
- Point 10: How good are the company’s cost analysis and accounting controls?
- Point 14: Does the management of the company talk freely to investors about its affairs when things are going well but “clam up” when troubles and disappointments occur?
- Point 15: Does the company have a management of unquestionable integrity?

As you can see, several of what Fisher considers important traits can be classified as Social or Governance concerns. Ignoring these characteristics is to miss important information.

Removal of Nuclear Restriction

Another change we made to the process is the removal of the nuclear constraint. This legacy constraint traces its roots directly to the Three Mile Island and Chernobyl accidents. These two events were devastating in nature; however, we believe the time to cast aspersions across all companies involved in the production of nuclear energy has passed.

We are removing the nuclear restrictions from our strategy for three reasons. First, while legitimate safety concerns linger, Generation 3 and Generation 4 nuclear power plants offer significantly increased safety in the form of improved “passive safety systems, longer lifelines, optimized fuel use, reduced construction time, reduced waste, and increased proliferation resistance.”^{xvii} Second, several companies which are involved in nuclear power generation are at the vanguard of alternative energy. NRG Energy and FPL are notable examples of this trend. Finally, nuclear power is one of Princeton University’s seven “wedges,” or choices, for policymakers to curb greenhouse gas emissions.^{xviii} Note that while we have removed this restriction from our strategy, an individual client may still direct AIP to prohibit ownership of nuclear companies in his or her portfolio.

Removal of ASSET4’s Economic Pillar

The introduction of positive scoring comes with its own issues. ASSET4[®]’s Equal-Weighted Rating, for instance, derives one quarter of its weight from economic, environmental, social, and governance scores, respectively. However, with AIP’s underlying forecasting process including fundamental analysis, our research shows the use of ASSET4[®]’s economic pillar to be redundant and ineffective^{xix}. Therefore, we have stripped ASSET4[®]’s economic score out of their Equal-Weighted Rating and re-blended the three remaining components to better complement our proprietary stock forecasts.

Sector Neutralization

For AIP, building core portfolios necessarily means avoiding systematic biases and focusing instead on pure stock selection as the primary source of active risk. However, we have found that ESG data tends to be systematically biased. For example, the Services sector ranked lowest in ASSET4®'s equal-weighted scoring of environmental, social, and governance metrics, followed by the Financial sector. Conversely, sectors such as Consumer Staples and Utilities rank highest (see table at right for a full breakdown).

In order to maintain the core nature of our sustainable strategies, we have normalized ASSET4®'s ESG scores within each economic sector and we have repeated that process for each industry as well. This enables us to implement a “best-in-class, best-of-breed” approach to SRI, wherein the companies with the best ESG ranks in any sector are favored and those in the bottom quintile of a given sector are avoided. Thus, AIP’s sustainable portfolios remove any broad sector bias which might have been introduced via positive ESG scoring.

ASSET4 - End 2007 Rankings*	
Consumer Staples	66.6%
Utilities	64.8%
Industrials	62.3%
Materials	61.8%
Technology	53.8%
Health Care	49.8%
Retail	49.1%
Energy	48.8%
Consumer Discretionary	48.7%
Financials	42.9%
Services	39.7%
AVERAGE	51.7%
*ASSET4 normalizes company ratings from 0 to 100, with 50 the median score. Higher scores are more desirable. (Source: ASSET4, AIP Research)	

Implementation via Penalty Function

Once neutralized, ASSET4 scores are passed to the optimizer as a penalty within the optimization function. Instead of the simple binary or subjective screening process used by most SRI managers, AIP implements an approach akin to positive scoring, wherein companies with higher ESG (or environmental) ratings are favored by the optimizer, and companies with lower rankings are penalized more heavily, *ceteris paribus*.

In addition, we eliminate stocks ranked in the bottom quintile of ESG (or environmental) rating from purchase consideration.

Multiple Strategies

Socially responsible investing, or Values-based investing, conjures different ideas for different groups of people. We have levered our ASSET4 relationship to create multiple strategies to accommodate a broad spectrum of investors. In addition to these strategies listed below, AIP is happy to explore customized strategies to better fit client needs.

All of the following strategies follow the same dual-benchmark strategy: the S&P 500 as primary benchmark (4-5% *ex ante* active risk), with a shadowing of our LargeCap portfolio as the secondary benchmark (1.5% *ex ante* active risk). This allows pursuit of the clients’ objectives while ensuring the client is invested in a true core large-cap portfolio.

Sustainable, Responsible LargeCap (SRL)

Our Sustainable, Responsible LargeCap strategy improves upon the traditional negative screening approach used by most socially-responsible practitioners. AIP’s SRL strategy eliminates all stocks which rank in the bottom 20% of their respective sector’s environmental, social and governance score. In addition, the portfolio maintains an ESG 10% higher than the S&P 500 Index, and favors the companies with the highest sector-neutral ESG score.

We found implementing this modified ranking and portfolio construction process resulted in reduced active risk, improved returns, a significantly higher-than-benchmark ESG score (averaging 14% higher than the S&P 500), and an environmental rank just under 10% higher than the benchmark. Importantly, this strategy can serve as a core large cap portfolio, rather than simply a niche allocation.

Sustainable, Responsible LargeCap		
Negative Screen	KLD	ASSET4
Alcohol	x	
Gaming	x	
MilitaryDefense	x	
Tobacco	x	
Sudan	x	
Bottom-Quartile ESG		x
Encouraged		
Environmental		x
Social		x
Governance		x

Green

Our SRL Green strategy favors companies with strong environmental records as measured by environmentally friendly product innovation, efforts to diminish use of resources, and improved emissions control. Borrowing from techniques used in the SRL strategy, we normalize ASSET4’s environmental score by economic sector. We eliminate any stock whose environmental score ranks in the bottom quintile of its sector and the portfolio’s weighted environmental score is constrained to be 10% higher than the S&P 500 Index’s weighted rank.

Again, this allows us to build a truly green core portfolio which emulates our well-established LargeCap strategy. Companies in the alcohol, tobacco, firearms, and gaming industries are not automatically restricted from the SRL Green strategy. Thus, rather than a “green” strategy which is narrowly invested in alternative energy, we offer our clients a strategy which invests across the US LargeCap spectrum, favoring companies in every sector which are at the vanguard of environmental protection within their respective peer group.

Green Strategy		
Negative Screen	KLD	ASSET4
Bottom-Quartile Environmental		x
Encouraged		
Environmental		x

We found implementing a green strategy in this fashion again resulted in reduced risk compared to a “traditional” negatively-screened SRI strategy, with slightly enhanced returns. This Green strategy resulted in a portfolio with an average environmental score more than 11% better than the S&P 500 benchmark, as well as and ESG ranking which averaged 10% better. Again, this portfolio remains core in nature, allowing it to be a core holding.

Catholic

Our Catholic strategy not only restricts companies involved in alcohol, tobacco, gaming, abortion, stem-cell research and pornography, but also encourages investments in companies with strong records of human rights and board diversity

The US Conference of Catholic Bishops has two major Principles of investment Stewardship: 1.) exercise responsible financial stewardship over its economic resources and 2.) exercise ethical and social stewardship in its investment policy. These Principles are in turn carried out by 1) avoiding participation in harmful activities, 2) using the Conference's role as stockholder for social stewardship, and 3) promoting the common good.

Catholic		
Negative Screen	KLD	ASSET4
Abortion	x	x
Contraceptives	x	x
Stem-Cell Research		x
Discrimination for race or sex		x
Pornography	x	x
Military/Defense	x	x
Land Mines	??	??
Encouraged		
ESG		x
Protect/promote human rights		x
Board diversity		x
Environmental		x
Benefits		x
Workplace Safety		x

Methodist

Based on the Investment Strategy Statement of The General Board of Pension and Health Benefits of the United Methodist Church, the Methodist strategy restricts alcohol, tobacco, gaming, pornography, land mines, defense, and nukes, while again encouraging board diversity, human rights, and environmental awareness.

Methodist		
Negative Screen	KLD	ASSET4
Alcohol	x	
Gaming	x	x
Land Mines	??	??
Military/Defense	x	x
Pornography	x	x
Tobacco	x	x
Encouraged		
ESG		x
Protect/promote human rights		x
Board diversity		x
Environmental		x
Food Safety & Product Labeling		x
Corporate Governance		x

Acting Locally

From a policy standpoint:

- We have become members of the Social Investment Forum, a group of 500 investment practitioners and institutions who integrate economic, environmental, social, and governance information into our respective investment processes. Learn more at www.socialinvest.org.
- We are one of 226 investment managers across the globe to sign the United Nations' Principles for Responsible Investment, a six-point framework for incorporating ESG issues in investing. The Principles reflect the notion that ESG issues can affect the performance of investment portfolios and that applying the six Principles may better align investors with the broader objectives of society. Learn more at www.unpri.org.
- We are one of 25 global investment managers to sign a request that brokers continue to support and expand ESG research, even as budgets are pared.
- We have signed a letter to urge companies to review their suppliers' possible use of child labor to source cotton in Uzbekistan.

Within our office, we focus on several simple initiatives:

- Shredding and recycling used paper
- Donating dated office furniture, computers and peripherals
- Curbing printing by using both sides of paper when copying and printing, and using an eco-friendly font which reduces printer ink use by 20% (learn more at www.ecofont.eu)
- Turning on only one of two overhead lights in our offices and ensuring lights are turned off when we depart for the evening
- Using blinds to regulate sunlight and modulate heating/cooling needs
- Using fully or partially recycled and/or green office supplies and paper where practical

In Closing

The alignment of environmental interests, automakers, agricultural industry, and security and energy independence advocates is a powerful force. Think of the solution to these environmental and social problems as a distributed Manhattan Project. Exponential growth in, and convergence, of supercomputing, data storage, advanced algorithms, biotechnology and nanotechnology is opening once unthinkable opportunities. The surge in investment is drawing top minds from university and corporate research labs, and could propel a disruptive change. And early movers may be beneficiaries of a tailwind.

i The World's Mangroves 1980-2005, Food and Agricultural Organization of the United Nations, 2008

ii Bruno, John. August 2008 Coral Reefs and Climate Change, the encyclopedia of earth, 2008.

iii The Thirty Costliest Mainland United States Tropical Cyclones 1900-2005, Atlantic Oceanographic and Meteorological Laboratory, 2008.

-
- iv Climate Change 2007 – The Physical Science Basis. Intergovernmental Panel on Climate Change, 2008. Cambridge University Press.
- v Jevrejeva, S., A. Grinsted, J. C. Moore, and S. Holgate (2006), Nonlinear trends and multiyear cycles in sea level records, *J. Geophys. Res.*, 111, C09012, doi:10.1029/2005JC003229, 2006.
- vi Pielke, R.A., Jr., & Landsea, C.W. (1998). Normalized Hurricane Damages in the United States: 1925-95. *Weather and Forecasting*, 13(3), 621-631.
- vii Waltham, T. (2002). Sinking Cities. *Geology Today*, 18(3), 95-100.
- viii Hon, H. & Kacperczyk, M. (2008), The Price of Sin: The Effects of Social Norms on Markets
- ix Lash, J. & Wellington, F. (2007), Competitive Advantage on a Warming Planet, *Harvard Business Review*, March 2007.
- x Corporate Governance and Climate Change: Making the Connection. Ceres, March 2006.
- xi 2007 Report on Socially Responsible Investing Trends in the United States, Social Investment Forum, 2008.
- xii Hesse, A. (2008), Long-Term and Sustainable Pension Investment: A Study of Leading European Pension Funds. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, May 2008.
- xiii Becchetti, L., Cicretti, R. & Hasan, I. (April 2007), Corporate Social Responsibility and Shareholder's Value: An Event Study Analysis, Federal Reserve Bank of Atlanta Working Paper 2007-6
- xiv Goodland, Jane. *Investing for the Future*, Watson Wyatt, 2007
- xv Collie, B. & Myers, H., "Responsible Investment: Five Tests of an SRI/ESG Policy", Russell Research, August 2008
- xvi Fisher, Philip A. *Common Stocks and Uncommon Profits*. Wiley & Sons, 2003.
- xvii Eurosif Nuclear Sector Report, May 2008
- xviii S. Pacala and R. Socolow, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies," *Science* 305 (2004): 968-72
- xix We examined the return spread between the highest and lowest rated quintile of stocks for the original ASSET4® Equal-Weighted Rating and our revised ratings. Using a 12-month holding period and annual rebalancing, we found our revised ratings outperformed the ASSET4® Equal-Weighted rating by nearly 3% per annum over the past six and one-half years.