



For policymakers, corporations and individuals, the effort to address climate change has moved into high gear, and poses significant new challenges—and opportunities—for investors.

Approval of the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015 was gamechanging. It marked the first time virtually all countries around the world agreed on a consensus plan to reduce our collective carbon footprint. In essence, the world now has a mandate and roadmap for stopping climate change. The UN's leadership, combined with many existing efforts in the private and public sector, signal that we have finally gotten serious about climate change.

#### So what does this mean for investors?

First, investors need to recognize that the movement away from fossil fuels is rapidly accelerating. The UN's framework was a reset moment. Over the next few decades, global industrialized economies will be fundamentally reshaped. That transformation will have a profound impact on future decisions about capital allocation and investment portfolios.

Second, as industrialized economies are re-engineered, investors can no longer expect the favorable risk/reward dynamics from placing capital in traditional companies or asset classes. In fact, the prospect for many of the world's largest fossil fuel companies are now threatened as we move toward a future based on solar energy. This phenomenon, which we described in one of our earlier white papers, is known as "stranded assets." (See our July 2014 report.)

Third, investors need to address significant, and perhaps unrealized, risks in their portfolios. With so much global capital invested in carbon-heavy industries, there is a threat for all types of investors, from pension funds and endowments, to individuals and their wealth managers. An investment strategy that factors in climate risk is likely to create portfolios that are better balanced. Conversely, a failure to recognize the changes ahead in one of the largest and most capital-intensive sectors of the global economy will likely expose investors to undue risk.

In this white paper, Veris takes a cautiously optimistic view on a new generation of climate solutions. We believe the concerted efforts of governments, corporations, nonprofits, foundations and individuals can have a positive impact on our environment and our societies. Working together, we believe we can mitigate climate change and ultimately reduce climate risk. Through these new solutions, investors will be presented with many opportunities to invest in emerging innovations and fund existing ones.

In this analysis, we will guide you through the following: In Part One, we highlight some limitations and risks that climate change poses on the global economy. In Part Two, we discuss climate-related opportunities. In Part Three, we review strategies for investing in a post-fossil-fuel world.

### **New UN Framework Makes History**

In December of 2015, the UNFCCC held its 21st meeting, where the heads of 196 countries met in Paris to negotiate and sign an historic Climate Agreement. The United Nations Climate Change Conference, commonly referred to as the COP21, ratified a global agreement to limit the global average temperature increase to 2° C above pre-industrial levels, and hopes to achieve an increase of only 1.5° C.

While scientists and economists have been prescribing these objectives for years, the breakthrough of the Paris Agreement was achieving global political consensus on the facts of climate change and the need to take immediate action. Now, countries, companies and individuals need to get to work realizing their commitments. As



the commitments of the agreement are translated into policies, they will also drive business operations. In the very near future, we expect a dramatic shift in the business and investing landscape toward a standard of climate risk analyses and integration.



## Climate change creates systemic risks to virtually all segments of global markets.

The Sustainability Accounting Standards Board (SASB), a nonprofit that helps public corporations disclose material, decision-useful information to investors, recently quantified the magnitude of climate impacts. Seventy-two of seventy-nine global industry sectors will be affected by at least one, if not more, of these climate risk categories, according to SASB's recent Climate Risk Bulletin. In other words, practically everyone on the planet will be affected.

As the impact of climate change accelerates, corporate profitability and government budgets are challenged globally, creating ripple effects across all markets. Oil, gas, coal and other extractive industries, in particular, arguably face the greatest threat of fundamental business-model risk. An illustrative example is the rapid decommissioning of coal electric plants. Peabody Energy, the global coal giant, filed for bankruptcy in April 2016, showing that even big players are not immune to the changing tide. The chart below demonstrates how fast the change is unfolding.

Government regulations aimed at limiting carbon emissions are also creating challenges for the fossil fuel industry. In 2015, the U.S. Environmental Protection Agency issued the Clean Power Plan, which put the nation on track to cut harmful pollution from the power sector by 32% below 2005 levels. Such measures may eventually leave fossil fuel reserves—that many argue are already grossly overvalued—partially unburnable or "stranded." Imagine the value of Exxon sans proven oil reserves.

Among factors likely to contribute to stranded carbon assets:

- A switch to lower carbon fuels: "Lighter carbon" fossil fuels are displacing "heavy carbon" fuels (e.g. coal to natural gas). This affects fossil fuel companies as well as all related energy generators, transporters and utilities in their industries;
- Legal challenges: Major oil companies have known about climate change science and risks for years.
  Because they failed to disclose what may be material

risks to investors, it is possible that their legal risks significantly exceed what the tobacco industry experienced;

- Reporting challenges to investors: Are we getting full and proper carbon risk reporting from companies? As investors, do we understand the material risks? How might reporting requirements change as the risk of stranded assets is increasingly considered material information?
- Company valuations: Are fossil-fuel companies properly valued given growing carbon risks?
  How does an investor (or company) rationalize investments for new exploration or land acquisition for new fossil fuel sources if the entire sector is potentially in long-term decline?

The net effect of tighter regulation, disruptive technologies, and a cultural shift away from fossil fuels is creating an increasing pool of "stranded assets." For investors, stranded assets are a potential liability because they are expected to shrink in value over time. Asset valuations in the coal industry—coal deposits, heavy equipment manufacturers, shares of mining companies and the supporting ecosystems—are all likely to decline over time as more energy is produced by natural gas, solar and wind. In all cases, stranded assets are a long-term and unpredictable investment risk.

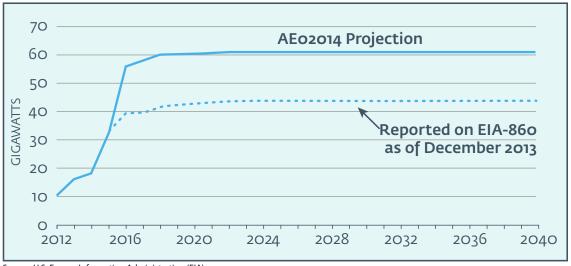
In truth, we already are seeing major cracks underpinning the fossil fuel investment thesis. Energy has been the worst performing sector in the market from March 2011 to May 2016, returning -17.98% cumulatively, versus 55.50% for the S&P 500. The reduced valuations set the stage for further incorporating stranded asset risk into oil company stock prices and the utility sector.

Clearly, the way businesses and investors choose to position themselves will determine the degree to which they experience risk and opportunity in the face of climate change.

#### Adapting to Climate Change Risk

Faced with the threats of increasing regulation and a declining market outlook, many oil and gas companies have realized that certain very expensive projects that seemed profitable in the past may not live up to their luster. After years spent vying for exploration rights, Royal Dutch Shell announced in late 2015 that it was abandoning exploration in the Arctic. Similarly, Exxon Mobil also abandoned its own Canadian arctic exploration programs in 2015. In both cases, billions of dollars of investments were abandoned. Energy companies increasingly understand that addressing the climate risks they face is imperative to their business.

# Projected Cumulative Retirements of Coal-Fired Generating Capacity (2012–2040)



Source: U.S. Energy Information Administration (EIA)



Despite the significant investment risks associated with climate change, there are also a world of opportunities in the capital markets. The following section highlights some key opportunities that combine both solid sustainability principles and potential strong investment performance over the long-term.

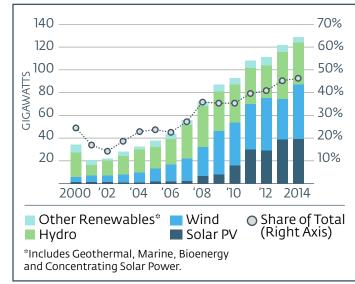
At Veris, we are particularly hopeful about certain initiatives such as: renewable energy, green buildings and smart cities, carbon pricing, and ecosystem resiliency. A description of each opportunity in these broad categories follows. In Part Three, we get more specific about the investment solutions in the public and private markets.

#### Renewable Energy

Globally, the majority of newly built electric generating capacity is now renewable. This stunning growth is driven by the price of solar power falling 90% in less than a decade. Solar energy is now cheaper than the grid average

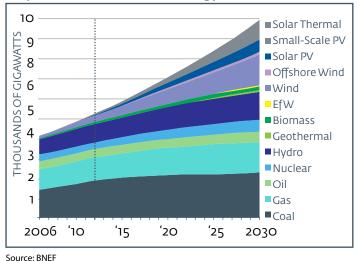
in Spain, Italy, Australia, Chile, Germany, Brazil, and at least 10 U.S. states. According to Bloomberg, more than \$8 trillion, or two-thirds of the world's spending on new power capacity over the next 25 years, will go towards renewables.

## Global Renewables-Based Power Capacity Additions



Source: EIA, Special Report on Energy and Climate Change 2015

#### Projected World's Total Energy Use



The speed and scope of transformation within the energy sector has already started to impact the job market. The Solar Foundation reports 174,000 U.S. workers employed by the solar power industry, indicating growth of 87% over the last five years. Globally, more than 7.7 million people are employed by the renewable energy industry according to the International Renewable Energy Agency (IRENA). And in 2016, Bloomberg reports that total U.S. jobs in the renewable energy industries now exceed jobs in the fossil-fuel industries. This dramatic shift will only accelerate. Lower production costs and an increasingly skilled labor force are coming together to advance smart innovation.

The rapid adoption of solar energy drives many other interrelated changes:

· Energy is now increasingly produced on-site. As a result, utility systems must change and developing countries won't have the same incentives as more advanced nations to build electricity grids. Like wireless communications, which leapfrogged landline technologies, solar energy production in the developing world will be linked and distributed.

- · Battery storage will become increasingly costeffective for a wide range of uses. Battery prices have dropped 70% since 2010. The further decentralization of power generation and usage will likely rearrange the infrastructure used to power everything from cars to phones.
- Electric vehicles will become ubiquitous. By 2030, it is estimated that at least 20% of all cars sold globally will be electric. The historic interconnection between transportation and Big Oil is winding down. Sweeping change results.

#### **Green Buildings and Smart Cities**

Green buildings are an opportunity to lower environmental impact through energy efficiency, sustainable design, and smart materials. According to the U.S. Energy Information Administration, the building sector uses 41% of total energy consumption in the United States. LEED, the certification program from the U.S. Green Building Council, promotes efficiency-driven technologies like smart shades and windows to lessen heating/cooling demands, sustainably sourced building materials, localized rainwater recycling systems, green roofs for insulation, and passive solar heating to name a few. Green buildings create more efficient systems by decreasing the impact of inputs (materials, energy) and outputs (waste) of traditional buildings. Because buildings have 50+ year life spans, the investor risk in NOT building/owning green buildings grows each year.

Cities are also integrating systems that promote efficient and sustainable use of resources. The concept of the smart and sustainable city is based on leveraging technology to minimize energy, waste, and resource consumption. Smart cities are interconnected systems that support long-term sustainable growth, human health, and well-being while reducing environmental impact.



"Today, our constitution is based upon the Holy Book and on oil. This is very dangerous. We have a kind of oil addiction in the kingdom."

—Deputy Crown Prince Mohammed bin Salman, Second in Line to the Saudi Throne

# "Sooner rather than later, financial regulators must address the systemic risk associated with carbon-intensive activities in their economies."

—Dr. Jim Yong Kim, President of the World Bank Group

Two pioneering smart cities are Singapore and Dubai. Singapore famously weaves abundant urban greenery throughout the city: parks, green roofs and vertical gardens. The city's seamless integration of nature into the urban landscape is not merely aesthetic; it also provides key ecosystem services such as air purification, heat absorption, and water runoff regulation. Singapore is also outfitted with efficiency-driven technology, such as a network of sensors that predict traffic congestion and re-route drivers, thereby minimizing auto emissions.

Dubai has achieved great strides in water and energy efficiency. Local power agencies are installing smart meters in homes to help residents monitor energy usage and increase efficiency. The city is also rapidly outfitting buildings with solar panels, while concurrently deploying a smart-grid system to more efficiently distribute and regulate the flow of electricity, making it easier to integrate "distributed" renewable energy.

Other regions have established similar carbon markets since the inception of EU ETS. California's Cap-and-Trade program, launched in 2012, set a statewide limit on greenhouse gas emissions, rationed out "allowances" to emitters, and enabled them to trade allowances as they saw fit. And according to the Senate's leading climate negotiator, Sheldon Whitehouse, there is growing support for a Carbon Trading approach in the U.S., including from companies like Exxon.

China made history last year when it announced its intention to implement a nationwide carbon market by 2017. China pledged to ensure their carbon emissions are capped and peak by the year 2030. A new report published by the Grantham Research Institute and London School of Economics finds that China will achieve this goal by 2025 or earlier through a combination of its carbon market and rapid deployment of renewables.

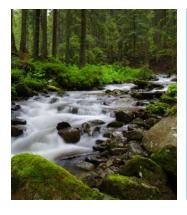
#### **Carbon Pricing**

Another interesting climate solution comes from the field of economics. Carbon pricing charges emitters a fee or a tax per unit of carbon dioxide pollution released. It is possible to build entire carbon markets around this simple concept in which polluters wishing to increase or exceed their emissions allocation must buy permits from others willing to sell them. This system incentivizes polluters to reduce emissions, particularly via methods accomplished most easily and cost effectively. The end result is reduced overall emissions at the lowest cost to society.

This system of emissions control is called Cap-and-Trade. It has been praised by economists and environmentalists as an extremely effective way to rein in growing global emissions. The first cap-and-trade system in the world was the European Union Emissions Trading Scheme (EU ETS), launched in 2005.

## From the European Commission's 2013 Fact Sheet on EU ETS:

The EU ETS operates in the 28 European Union countries, plus Iceland, Liechtenstein and Norway. EU ETS limits greenhouse gas emission from heavy energy-using industries such as power and heat generation, manufacturing, materials refineries, and civil aviation. By putting a price on carbon and thereby giving a financial value to each ton of emissions saved, the EU ETS has placed climate change on the agenda of corporate boards across Europe. By allowing companies to buy credits from emission-saving projects around the world, the EU ETS also acts as a major driver of investment in clean technologies and low-carbon solutions, particularly in developing countries.



"It seems clear to me that climate change is a problem which can no longer be left to a future generation. When it comes to the care of our 'common home', we are living at a critical moment of history."

—Pope Francis

As the world's largest emitter of greenhouse gases due to its size and population, China can contribute mightily to curbing global emissions. Current leadership appears committed to implementing this plan. However, maintaining its rapid pace of economic growth and desire to encourage domestic consumption could weigh heavily on China's environmental agenda.

#### **Protecting Ecosystems**

Preserving ecosystems worldwide is perhaps the most powerful way to halt climate change. Planet Earth has developed its own exquisitely synchronized set of carbon reducing systems, which arguably are the best combatant to climate change.

Natural ecosystems like oceans and forests are factories for sequestering carbon on a scale not replicable by technology. For example, every year, roughly 2 billion tons of carbon dioxide from the atmosphere is naturally absorbed by our oceans. Atmospheric carbon dioxide creates a series of chemical reactions in which a portion of atmospheric carbon dissolves into the ocean naturally. Similarly, another 2.5 billion tons of carbon dioxide is absorbed by the world's forests. Trees and other plants take in carbon dioxide through photosynthesis and use it to build biomass.

Powerful as these carbon sequestration systems may seem, it is important to remember that they are in delicate balance. As atmospheric carbon dioxide grows, increased chemical reactions result in ocean acidification. Even tiny changes in the oceans natural pH balance can have devastating effects on its species and ecosystems. In fact, coral reef systems all over the world are dying off from ocean acidification at an alarming rate. Natural carbon sinks are not necessarily permanent either. While carbon

absorbed by the world's forests is converted and stored as plant biomass, when a plant dies and its biomass undergoes natural decomposition, much of its carbon content will once again be released back into the atmosphere.

These forces do a remarkable job of maintaining natural carbon balance, but we cannot rely on them to stabilize the extreme imbalances we have created. By investing in opportunities such as ocean health and ecosystem resiliency, investors put their money towards nurturing and maintaining these powerful natural sequestration processes.

#### The Road Ahead

There are enormous climate issues upon us. Veris believes we're making progress in addressing them, and there is good news on multiple fronts. The race is on!

In addition to the achievements of UN's COP21, the International Energy Agency recently announced that for the second year in a row, global GDP grew while global emissions leveled off. 2014 was the first year since both metrics have been recorded that emissions and GDP growth appeared to decouple. The confirmation of the pattern again in 2015 only strengthens the case for optimism. These findings challenge the myth that any policy to reduce emissions will automatically push countries into economic decline. We now have positive affirmation that more countries may be able to decouple their emissions from their growth.

In totality, climate solutions are a smarter way to invest. By placing capital in these kinds of opportunities, investors are reducing exposure to climate risk, while also investing in the innovative technologies shaping our future.



Veris believes that investors who recognize climate risk in their portfolios and take steps to address those risks will be better off in the long run. Here are some of the solutions that Veris, working with its partners and investment managers, can offer you:

### **Building Portfolios for Climate Solutions**

More investment managers are developing strategies to invest in businesses that are accelerating the transition to a low-carbon economy. These strategies vary widely. They include everything from low-carbon portfolios of publicly listed companies, to venture and private equity funds that actively invest in private companies building and operating renewable energy infrastructure. Some approaches focus on divesting from fossil-fuel companies. Other opportunities may focus on effectively managing waste and promoting recycling, or sustainably managing farmland, forests, and wildlife reserves. Many investment professionals are building expertise around climate solutions, and more targeted strategies continue to emerge. Below, we outline some investment opportunities in public and private markets.

## Naming Climate Solutions Investment Approaches:

The shift to sustainable and low-carbon investing approaches has many names. Here are several to help simplify:

- "Low-Carbon": Investments in companies implementing strategies to reduce carbon in their operations broadly and specifically in their energy supplies.
- "Fossil-Fuel Free": Investment strategies that specifically eliminate certain fossil-fuel energy companies from portfolios. Common approaches involve eliminating coal companies or 350.org's list of highest-carbon energy companies.
- "Best In Class": Strategies that continue investing in energy companies and related industries—but are focused on those companies best at mitigating their climate impacts.

#### **Public Market Strategies**

For those investing in the equity market, there are some 250 equity and fixed-income mutual funds, ETFs, and Separately Managed Accounts (SMA) targeted towards environmental sustainability. Many exclude companies earning revenue from extractive businesses engaged in oil, gas, mining, utilities, storage, and transport of energy. Others may use a "Best In Class" strategy to invest in the companies that are leaders in their sectors with regard to climate change and sustainability. Even if no specific investment fund exists to address a particular climate issue, many managers have the ability to use custom screens to build a portfolio that suits a client's personal focus.

Shareholder engagement—the ability of investors to use their ownership of shares in a company to encourage

better corporate practices—is an important strategy for impact investors to promote change. Engagement can take the form of supporting public policy campaigns, or joining or sponsoring shareholder resolutions that are voted on at companies' annual meetings. Many impact and sustainable investors provide their proxies to environmental organizations to vote. In 2015, shareholder resolutions were filed with hundreds of companies in efforts to improve corporate behavior on climate change. They included: quantitative goals for reducing GHG emissions, pollution reduction targets, tying compensation to sustainability performance, restrictions on deforestation, recycling policies, water risk mitigation, and reporting on carbon or climate risk.

#### Integrating Your Portfolio

There are a variety of tools available for investors considering shifting their portfolios. Below are several considerations that Veris uses in guiding interested investors through climate solutions investing:

- 1. Study the Issues: What aspects of climate change are most important to you and which solution areas do you want to address? Identifying how large institutions weigh both divesting and reinvesting in their portfolios may help individual investors shift their own understanding. Carbon Tracker Initiative and 350.org are two resources that cover current developments. The Sustainability Accounting Standards Board (SASB) also offers great resources on sustainability metrics that investors may want to consider by industry sector.
- 2. Get to Know Your Portfolio: Investors can analyze environmental impact by reviewing the investments in their portfolio. Some points to consider are:
  - Percentage share of investments within the portfolio allocated to the energy sector
  - Potential carbon risks from non-energy investments
  - Implications of climate change on non-energy holdings

- Investments that may be exacerbating climate issues
- Current investments in renewable energy and other climate solutions
- Investors can also create an Investment Policy Statement (IPS) to address their intentions for their portfolio in these matters.
- 3. Make the Change: When choosing a strategy, it is important to remember that these approaches are not mutually exclusive. Often, by choosing a combination of these strategies, investors can create an optimal portfolio that integrates investing in climate solutions, divesting from fossil-fuel assets, and shareholder advocacy to motivate public companies to be more responsible and sustainable.

Fixed income fund managers integrate environmental, social and governance (ESG) factors into credit risk and bond selection, utilizing material non-financial sustainability considerations to help them determine credit quality. State and municipal bond proceeds can finance projects in climate solutions, such as: environmental equipment and facilities construction, low-carbon public transit, building renovations to meet greener standards, methane capture on farms, and renewable energy development.

#### **Private Market Investments**

Many specialized private equity, venture capital or private fixed income managers tailor their funds to focus on particular impact areas in natural resource health, carbon reduction, renewable energy infrastructure, smarter cities, rainforest protection, or ecosystem rejuvenation. These opportunities allow investors to more directly fund specific projects seeking to deliver high impact.

Climate solutions in private investments can target a variety of issues such as:

- Cleantech Infrastructure—Aimed at measurably reducing carbon emissions, there are many fixed income opportunities to finance cleantech infrastructure and facilities that operate and maintain solar, wind power, water, ethanol, biogas, or fuel cell assets.
- Habitat Conservation—As natural resources become scarcer, there will be increased value in the restoration, preservation and conservation of marine, freshwater, land, and wildlife habitat. Investment approaches include: Conservation Easements, legally binding agreements between landowners and protection organizations; Mitigation Banks, akin to carbon trading, allowing land developers to purchase environmental credits to offset construction; and technology tools for modeling, quantifying, and replicating restoration projects.
- Waste Management—Humans will generate close to 2.5 billion tons of solid waste annually by 2025, costing roughly \$375 billion each year to clean up while also releasing high levels of emissions, causing air pollution, water pollution, and negative health and social implications. Investment focuses include: innovative

To discuss investment opportunities or for help in devising an impact investing strategy to reduce carbon in your portfolio, contact us at www.veriswp. com.

technologies like anaerobic digestors that create biogas from waste; more efficient municipal solid waste treatment; and software to help hospitals, restaurants and industrials process waste more responsibly, including composting.

- Sustainable Agriculture & Forestry—Agribusiness is responsible for roughly one-third of human-induced GHG emissions. There is increased demand to shift farming and forest management to methods that increase positive health outcomes, replenish fertile soil, reduce pesticide run-off, increase yields, and create long-term environmental value. Investment approaches include: investing in local, sustainably managed farms, either through direct investments or funds; Real Estate Investment Trusts (REITs) that focus on sustainable farmland management, investing in organic or sustainable food and consumer goods companies; and agroforestry, the integration of trees with crops or livestock.
- Smart Buildings—The increasing populations of large cities is a major 21st century trend that is influencing urban planning and sustainability of metropolitan areas. Idle vehicles, utilities, and skyscrapers use massive amounts of energy and pose a significant climate risk. Investment approaches include: efficient transport systems; green buildings with improved water, air, heating and cooling; interconnected urban services; and urban roof-top and vertical agriculture.

12

### Let's Change The World Together

Climate change requires the full mobilization of governments, investors and the broader public. Current climate risks to our lives, our investments and ecosystems are unprecedented. Fortunately, opportunities for transformation to a sustainable, low-carbon, inclusive economy are also before us. Those investing to drive this new positive future are likely to benefit.

Veris can help you make the decisions about which investments are right for you. Our passion and our expertise is helping investors align their wealth with their values. In our research, we've identified the funds and products that we believe provide the best balances of impact and financial return. We see so much potential for investors to combat climate change in the markets. We are excited to help you and to support progress in addressing climate change.

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### **About Veris Wealth Partners**

Veris Wealth Partners, LLC is an independent, partner-owned wealth management firm that aligns investors' wealth with their financial and social objectives. Veris believes that superior investment performance and positive impact are complementary parts of a holistic investment strategy. Veris has been a certified B Corporation since 2011. Veris is based in San Francisco with offices in New York, Portsmouth, and Boulder.

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#### Footnotes & Resources

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