

Global Challenges: A Search for Pragmatic Solutions



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What are “Global Challenges”?

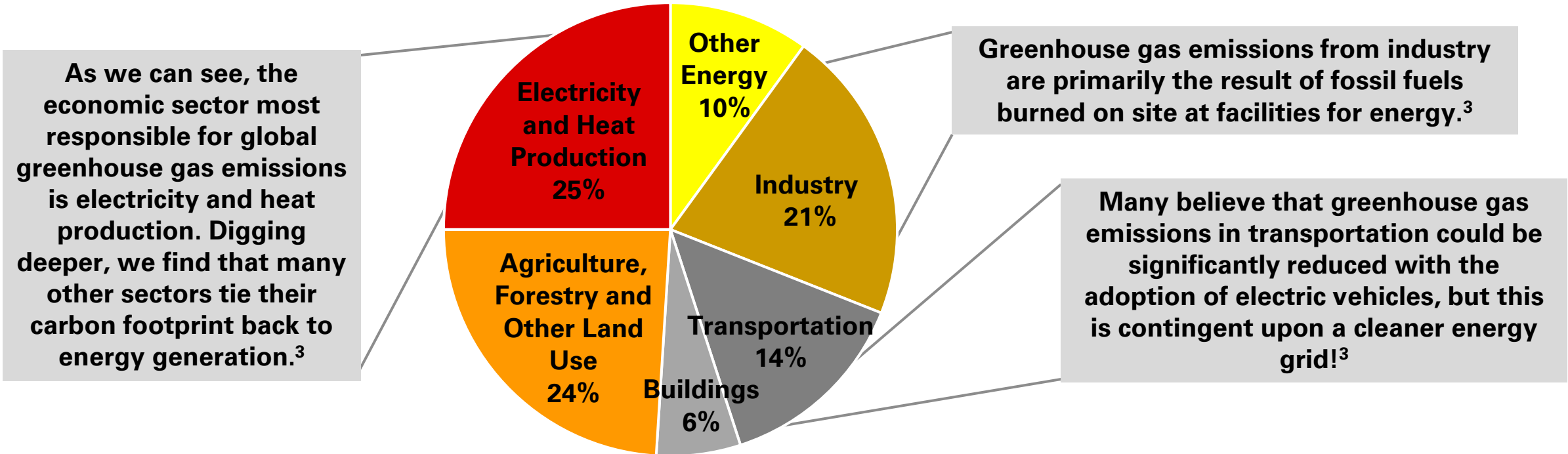
We define “Global Challenges” as the large-scale changes that must be made by consumers, corporates and sovereigns to prevent our environmental impact from adversely affecting commerce and quality of life.

While frequently framed in an environmental or social context, we feel there is a strong (and all too often ignored) set of economic consequences that arise from failing to find solutions to these challenges:

	SHIFTING ENERGY PARADIGMS		LOW IMPACT MATERIALS		MODERN WASTE MANAGEMENT
<p>Climate change has the potential to damage assets and infrastructure and weigh heavily on economic productivity-¹ in order to stop or at least slow the impact of climate change, we must reduce carbon emissions from our energy grids.</p>		<p>Global consumption patterns are adversely affecting our supplies of water, food and other resources-² advancements in materials technology can help reverse this, while achieving significant cost savings for consumers and corporates.</p>		<p>Current supply chains produce too much waste and do too little to mitigate the impact of that waste- new methods and technologies can allow more efficient and cost-effective use of resources, while reducing environmental impact.</p>	

Shifting Energy Paradigms

Considering the potential consequences of climate change, we believe it important to consider what drives greenhouse gas emissions:



With these factors in mind, we feel the issue of climate change can best be solved through reducing reliance on hydrocarbons and increasing our power generation capacity from economically viable renewable energy sources.

The Power Grid of the Future

We have identified several technologies we think will allow electricity producers to keep up with growing global demand while reducing their carbon footprint:

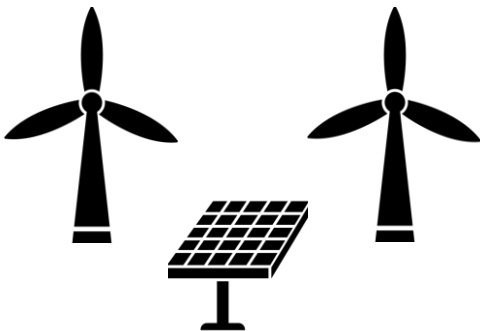
SMART GRIDS

Regardless of the ultimate source of electricity, we believe that digitization of the power grid, through innovations like connected “smart” meters and automation systems, will facilitate more efficient generation, management and distribution of power.



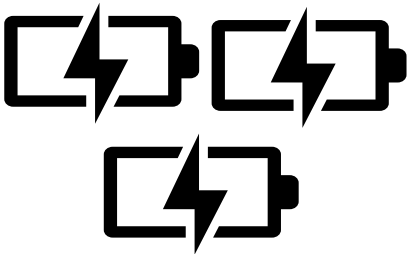
RENEWABLE ENERGY

Thanks to technological advances in recent years, wind and solar power, under many circumstances, are now cost competitive with conventional energy sources, even without government subsidies.⁴



BATTERY STORAGE

Improvements in battery technology allow for energy to be more efficiently stored and distributed, in turn enabling more seamless integration of renewables, decentralized systems and fewer interruptions to service.



Who Builds the Grid of the Future?

Creating an energy grid suited for the challenges of tomorrow is no small feat, requiring the participation of a wide variety of players, all of whom, we believe, bear watching as these changes take shape:

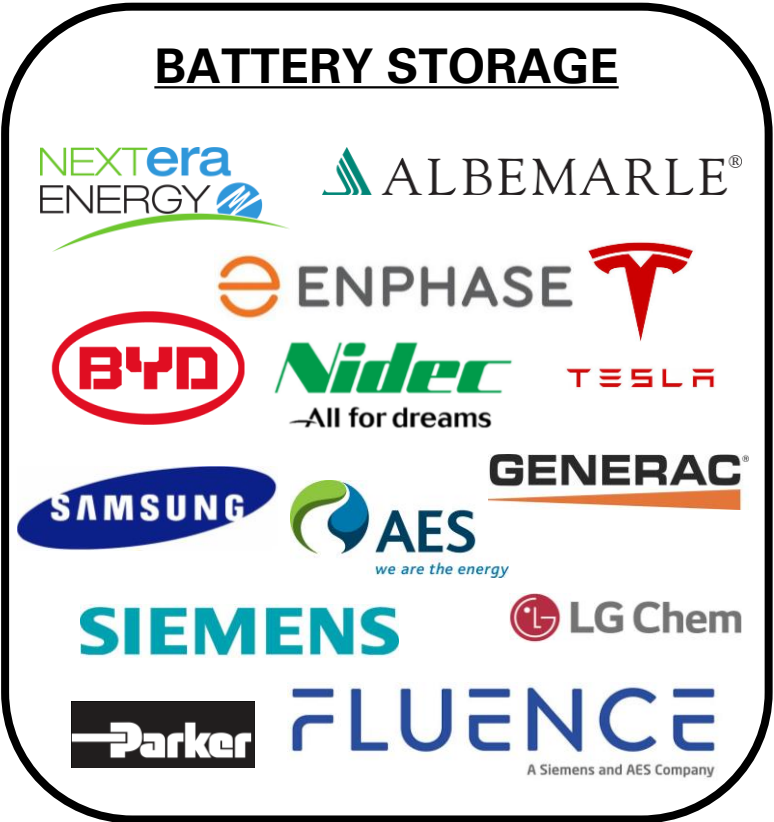
SMART GRID



RENEWABLE ENERGY



BATTERY STORAGE



Company Profile: ABB



ABB is a provider of power and automation technologies to a wide variety of utilities, industry, transportation and infrastructure customers. Its products range from industrial robots to equipment for EV charging stations.

Role in the Grid of the Future⁵:

- With a long history in the space, ABB's Power Grids business is considered one of the global market leaders, offering solutions in both grid hardware and software.
- Recently, the company has reoriented this segment to focus on building what it refers to as a "stronger, smarter and greener" grid.
- Key solutions worth noting include ABB's flexible transmission systems to better integrate renewable production into the grid, and a set of integration products which allow for seamless grid digitalization.

Company Profile: Vestas Wind Systems A/S



Vestas is one of the world's leading manufacturers, installers and servicers of wind turbines. With 108 GW of power capacity in 80 countries around the world, no company has installed more wind power than Vestas.

Role in the Grid of the Future⁶:

- With one of the leading positions in the market for wind turbines, Vestas is one of the major players in the global transition to renewable energy.
- The company has dedicated itself to constant innovation, leveraging smart data capabilities and a massive installed service base to produce cutting edge wind power solutions.
- Through its joint venture with Mitsubishi Heavy Industries, Vestas is also a leader in the fast-growing market for offshore wind farms.

Low Impact Materials

Recently, there has been an increased public concern over single-use plastics, especially given their impact on key resources like our food and water supply:

Plastics production has risen dramatically in recent decades....

3.6x

the amount produced in 1989⁷

...with a significant portion used for packaging:

42%

estimated, mostly for single-use⁷

Only a small amount of it is ultimately recycled:

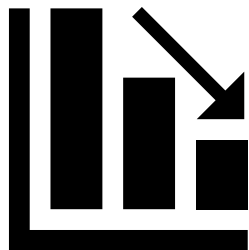
72%

Ends up in a landfill or in nature, especially the ocean⁷

This is a problem with real economic consequences: according to a 2019 study by the Plymouth Marine Laboratory, after considering its impact on fisheries, aquaculture and recreational activities, plastic pollution in the ocean is estimated to cost \$2.5 trillion annually, or ~3% of global GDP!

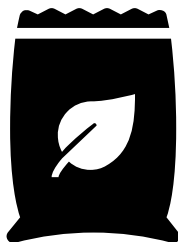
Solving the Plastic Problem

The costly impact of our current plastic consumption paradigm can be mitigated through advances in materials technology, and new methods for packaging products:



REDUCING PLASTIC

Many consumer goods companies (and the packaging companies that serve them) are working on improved designs for their products. These designs consume less plastic and seek ways to reduce superfluous packaging, cutting costs in the process.⁸



RETHINKING PLASTIC

Plastic does not need to be made from fossil fuels and last centuries in a landfill- bioplastics are derived from renewable, plant-based sources. Many of these are biodegradable or compostable and can break down in as little as several months.⁹



REPLACING PLASTIC

In some cases, plastics can be done away with altogether, replaced by various types of pulp/paper, metal and glass. Packaging made from these materials is generally easier to recycle, and in the long run may prove more cost effective.⁸

Who Makes and Uses Low Impact Materials?

In order to identify the key beneficiaries of the move to sustainable packaging, we believe one must consider the entire value chain:

CONSUMER GOODS COMPANIES



Logos of Consumer Goods Companies: Coca-Cola, Henkel, Nestle, Danone, P&G, Colgate-Palmolive, Unilever, and RB.

BIO(DEGRADABLE) PLASTICS



Logos of Bio(Degradable) Plastics companies: Avantium, Solvay, Corbion, BASF, Covestro, Piovan, Lyondellbasell, Krones, Arkema, and Loop Industries.

ALTERNATIVE PACKAGING



Logos of Alternative Packaging companies: Graphic Packaging International, UPM, Storaenso, Ball, Crown, Smurfit Kappa, MM Karton AG, Mondi, SIG, WestRock, DS Smith, and International Paper.

Company Profile: Corbion NV



Corbion is a leading producer of ingredient solutions for both the food and biochemical industries. It is the global market leader in lactic acid and its derivatives, a key ingredient in a number of products, including foodstuffs, cosmetics, solvents and pharmaceuticals.

Role in Low Impact Materials¹⁰:

- Corbion has leveraged its knowledge base in ingredient solutions to develop an Innovation Platforms business unit.
- Among the key projects pursued are a 50/50 joint venture with Total SA for the production and marketing of poly lactic acid (PLA), a biobased and biodegradable polymer that can replace traditional plastics.
- This JV is a leading producer of PLA globally, which is expected to see increased use given its versatility and similarity to traditional plastics.

Company Profile: Stora Enso Oyj



Stora Enso is an integrated paper, packaging and forest products company. It is the #2 producer of paper in Europe, and a world leader in the production of fiber-based renewable products.

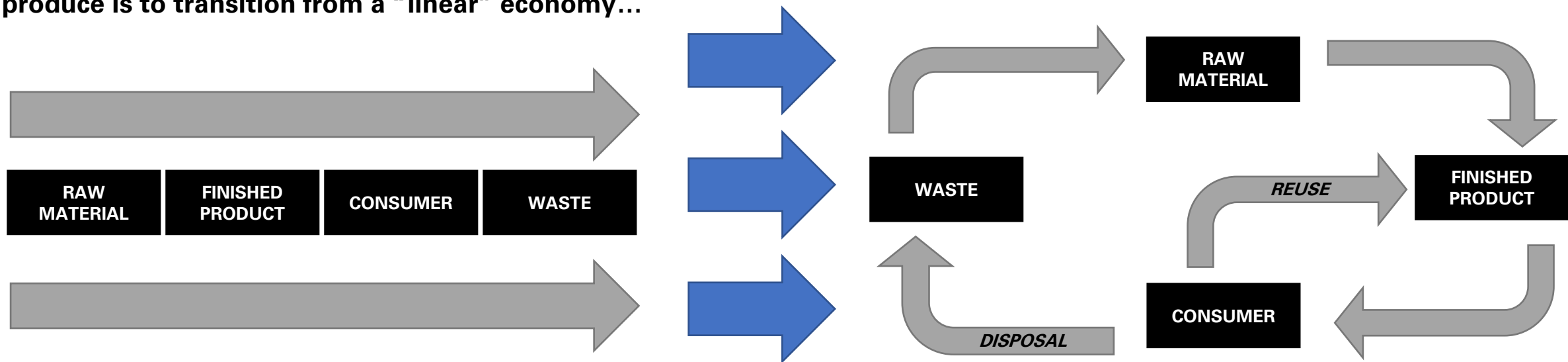
Role in Low Impact Materials¹¹:

- While most paper products companies, by virtue of their product lines, are in the business of providing low impact materials, Stora Enso has made this a major strategic focus.
- Recent innovations include biodegradable straws, renewable caps and closures for liquid packages, and an eco-friendly product for fresh fish packaging.
- Stora Enso is currently working directly on the development of biocomposites to reduce the need for fossil polymers in plastics.

Modern Waste Management

Regardless of what our waste is comprised of, we produce far too much of it- while a cost to our environment, this waste is also a cost to the bottom lines of both corporates and consumers.

One way to reduce the amount of waste we produce is to transition from a “linear” economy...



In order for this to become a reality, the global waste management industry must be expanded significantly and also must be better adapted to suit the needs of this new economic model.

What Drives the Circular Economy?

There are several key trends to pay attention to as more of what we consume re-enters the production cycle, driven by improved and expanded waste management capabilities:

INCREASED RECYCLING RATES

Recycling rates, even in the developed world, are quite low, with growth, driven by new government programs and incentive schemes.¹²



EMERGING WASTE MANAGEMENT

Waste management remains an informal industry in many emerging markets, but we believe more institutional solutions will be sought after in the coming years.¹³



THINKING "BEYOND THE BIN"

We believe recycling programs will go beyond the usual "paper, plastic, glass" and deal with more complex items like electronics, automobiles and appliances.



Who Turns Trash Into Cash?

We view larger, global waste management players, along with more niche players and suppliers, forming a compelling opportunity set within this space:

GENERAL WASTE MANAGEMENT



NICHE PLAYERS AND SUPPLIERS



Company Profile: Veolia Environnement SA



Veolia provides a wide variety of services to municipalities and businesses throughout the world, with a particular emphasis on energy and water services as well as waste management.

Role in Modern Waste Management¹⁴:

- With its global footprint, Veolia has grown to become one of the world's largest waste management and environmental services companies in the world.
- The company operates many innovative facilities, including 104 composting platforms, 7 biogas plants and 63 waste-to-energy projects.
- In the face of rapid population growth and urbanization, Veolia is increasing its focus on emerging regions like Africa for its water and waste management services.

Company Profile: Derichebourg SA



Derichebourg is a global provider of environmental services to businesses and local and municipal authorities. Its activities include waste collection, urban cleaning, and industrial waste disposal.

Role in Modern Waste Management¹⁵:

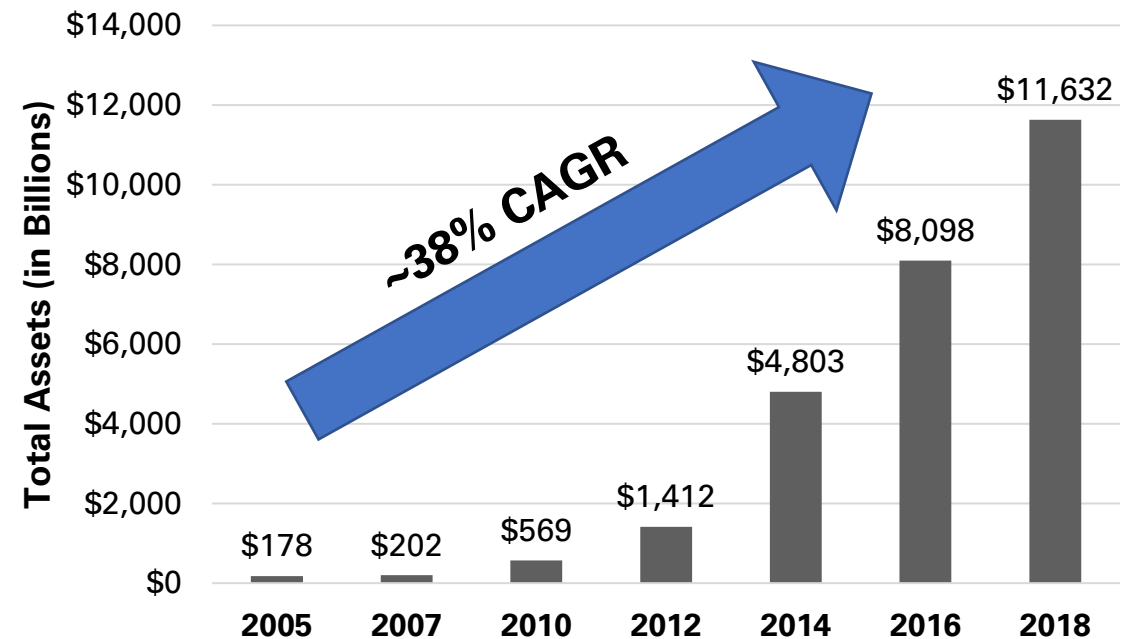
- While a provider of traditional waste collection and management services for several cities, Derichebourg is best known for its metals recycling business.
- The company is the leader in its native France, as well as in Mexico, Spain and several US states thanks to the density of its collection site network.
- Derichebourg is seeing an increasing amount of its scrap metal coming from “end of life” automobiles and electronics.

A Grounded View

In recent years, we have witnessed an increasing interest in environmental issues, not only by consumers, corporates and sovereigns, but also providers of capital.

- As a result, “sustainable” or “ESG” (environmental, social, governance) investing has become increasingly popular amongst institutions and individuals alike.
- While we feel this increased awareness is admirable, we also believe that this has also created an investment channel somewhat divorced from economic realities- supporting structurally challenged business models and driving up the value of profitable, but “obvious” ESG plays.
- In our eyes, investors should seek to identify businesses that are levered to solving global challenges through tangible results and profitable operations- while frequently just as dedicated to environmental sustainability, their ability to achieve economic sustainability gives these companies the ability to have an even greater impact.

ESG Assets by US Money Managers¹⁶



Overview

In summary, we believe that “sustainable” investing is best considered in the context of those companies which are providing solutions to the challenges we face globally.

- Some key “Global Challenges” include:
 - **Shifting Energy Paradigms:** With most carbon emissions ultimately derived from energy production, the transition to renewables offers an increasingly compelling solution.
 - **Low Impact Materials:** While plastics have improved the lives of consumers in countless ways, we must develop new packaging materials and methods to mitigate their negative externalities.
 - **Modern Waste Management:** Waste is exactly that- a waste! Given the economic impact of this waste, expanding our ability to reuse and recycle materials will drive down costs for corporates and consumers.
- While we feel that the rise of ESG investing does help raise awareness of the Global Challenges we face, we also believe investors are best served taking a more nuanced view of investing in this space.
- In particular, we believe those businesses which offer compelling solutions to the challenges we face while creating shareholder value stand in the best position to have a positive impact for the long term.

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