



When the Levee Breaks: Sustainability, Investing & Innovation in 2020

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*“If it keeps on rainin’, levee’s goin’ to break
If it keeps on rainin’, levee’s goin’ to break”*

This old country blues song, written by Kansas Joe McCoy and Memphis Minnie in 1929, was sung in reference to the Great Mississippi Flood of 1927. While many of us are more familiar with Robert Plant’s electrified, harmonica-filled, and slightly more howling version of these lyrics from the 1971 Led Zeppelin classic, the words still ring true today.



The Great Flood of 1927 was the worst flood in the history of the United States. This episode in history set the stage for a battle between man and nature when the pre-existing engineering and technology “know-how” was ultimately proven inadequate. In the spring of 1927, the U.S. Corps of Army Engineers assured the public that, despite tremendous rains, the levee system that contained the river would hold. The founder and leader of the U.S. Army Corps of Engineers at that time was James Buchanan Eads, who was a decorated engineer, technician and proclaimed “genius.” His prestige and reputation was such that Eads was considered one of the five greatest engineers of all time, ranking him alongside Leonardo Da Vinci and Thomas Edison.

However, as the rains of 1927 ensued, the levees were pushed too far, and Eads’ untested theories met their match. Ultimately, 27,000 square miles were engulfed in 10 feet of water, resulting in more than one million



homes flooded. The river grew beyond 70 miles wide, with entire towns and communities wiped out. The monetary damage from the flood equaled one-third of the 1927 federal budget, which today would have been the equivalent of more than \$1 trillion. This led to significant political and social change, including a new wave of migration, and helped elect Herbert Hoover as President. It's also a striking example of the limits and evolution of technologies that outlive their capabilities.

As we endure a different environmental and social crisis today, many investors are spending 2020 assessing where best to direct their capital in a time of significant uncertainty and change. Meanwhile, pressure is building on a myriad of societal, environmental and economic structures previously taken for granted. Against the backdrop of a global pandemic, increasingly worrisome evidence of climate change, and ongoing social unrest, it's not hard to notice the slow drip, drip, drip of pressure against today's levees, leading many of us to prioritize investment themes more oriented around sustainability.

Sustainable Investing and the Private Markets

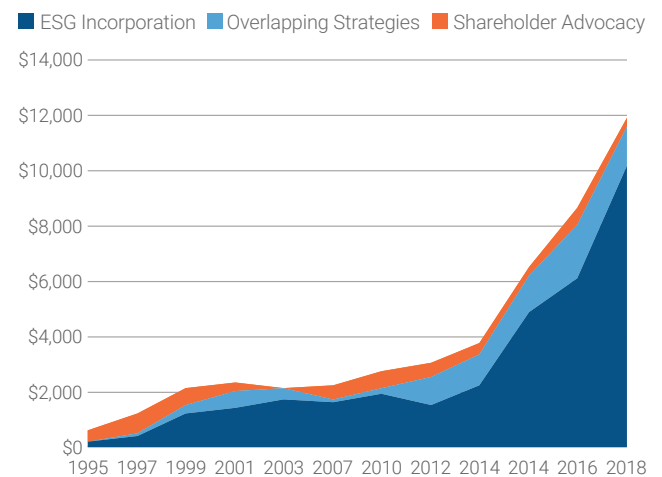
One of the advantages of investing in the private markets is the patience of private capital. As private markets investors, we are fortunate to analyze and influence opportunities that will develop over four, five, or more years, often driven by disruptive market changes. At the most obvious macro level: Growing frequency of wildfires, hurricanes, floods and other natural disasters, as well as new pressures on our healthcare systems, are already generating meaningful capital requirements and will likely continue to do so. General partners are now seeing a massive range of opportunity across themes that touch on issues of sustainability and larger economic and environmental transitions.

This should not be a surprise. According to a 2018 biennial report released by the U.S. Sustainable Investment Forum (SIF), \$11.6 trillion has been invested into assets that fall into categories defined as sustainable, responsible or impact-oriented. The \$11.6 trillion invested represented an increase of 38% from 2016, and has likely grown since then. Perhaps even more noteworthy, this figure represents one in four dollars of the \$46.6 trillion invested under professional management in the United States during the same time frame.¹

The chart below from the 2018 U.S. SIF report shows the recent exponential growth of this sector of the investment universe. While there may be some debate over what is captured in this chart and what qualifies as sustainable versus another ESG category, there is no denying the upward trajectory.

Sustainable and Responsible Investing in the United States (1995–2018)

Total Assets (in Billions)



Source: US SIF Foundation.

According to Webster's Dictionary, "Sustainable" means "...a method of harvesting or using a resource so that the resource is not depleted or permanently damaged." While this immediately leads one to consider real asset and natural resource investing, the term also extends beyond these core areas and into a concept of "doing more with less" or, simply put, resource efficiency. Consumer products, food and agriculture, transportation, and even software, among many other sub-sectors, contain abundant sustainable investing themes within them. While sustainability is much more than an energy strategy, it makes sense to start here to provide some context and a brief case study on one area driving sustainable investment.

The Energy Sector in Transition: A Major Tributary of Sustainability

Over the past several years, we have witnessed a discernable shift across the private energy landscape as part of an "energy transition" away from a fossil fuel-driven economy. Alongside falling oil prices, the natural gas investment boom has slowed, with demand shifting toward renewables and electrification. We are watching

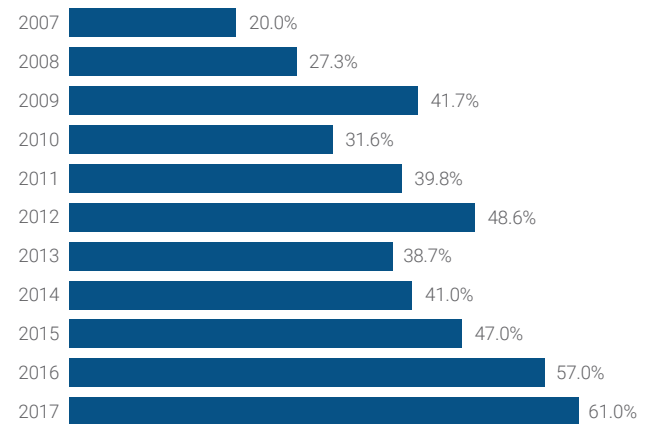


this transition unfold first hand as capital attempts to form by new private markets funds in development. Large, influential institutional LPs and family offices across the U.S. and Europe are leading this change, but it also is being driven by reallocation and capital outflows. The underperformance in recent years of conventional hydrocarbon-oriented energy strategies is driving a search for more attractive long-term energy investments and better absolute financial returns.

At Hamilton Lane, we are seeing a significant evolution in the type of energy-related investing across the private markets. We can observe this trend by comparing our market activity during the 12-month LTM period through June 30, 2020, with the LTM period leading up to June 30, 2019. As of the LTM period ending June 30, 2020, Hamilton Lane received 51 PPMs from managers with a focus on energy-related investing who were seeking to raise and deploy \$74 billion into these strategies. This was a 75% increase in the number of fund managers across these strategies and a 300% increase in the amount of capital being raised. But what is perhaps most interesting is how the focus of these energy managers has shifted. Over the past 10 years, the capital being raised by diversified energy has grown almost 400%, while the number of managers has only grown 50%. Many of the successful incumbent managers are scaling in size and diversifying their strategies beyond traditional oil & gas. Among focused energy managers, the proportion targeting renewable and energy transition strategies has grown by 400%, and the capital they are raising is growing by almost 25 times the capital previously raised. Conversely, managers focused on hydrocarbon energy investing alone are raising 50% less capital in 2020 than they were in 2010.²

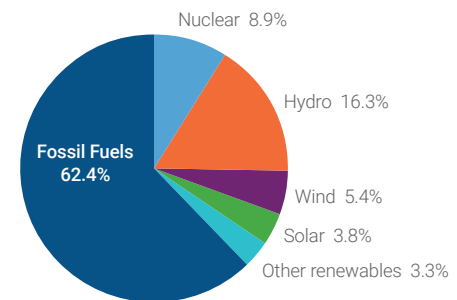
This private capital formation is part of a global energy trend. As of last year, according to Credit Suisse's Alternative Energy Report, approximately 38% of power generation was driven by non-fossil fuel sources.³ Clearly there is still a long way to go before renewable sources become the dominant energy source, but the change is happening at an increasingly rapid rate. In fact, over 60% of new global energy generation in 2017 was through renewable sources – up from just 20% of new energy from renewables in 2007. During the next three years, renewables are estimated to add nearly 50,000 MW, becoming more than a quarter of the total capacity. This is illustrated in the charts to the right.

>60% of new generating capacity from renewables



Source: Government data, EIA, BP Statistical, IHS, GTM/SEIA, company data, UN Environmental Programme Credit Suisse estimates.

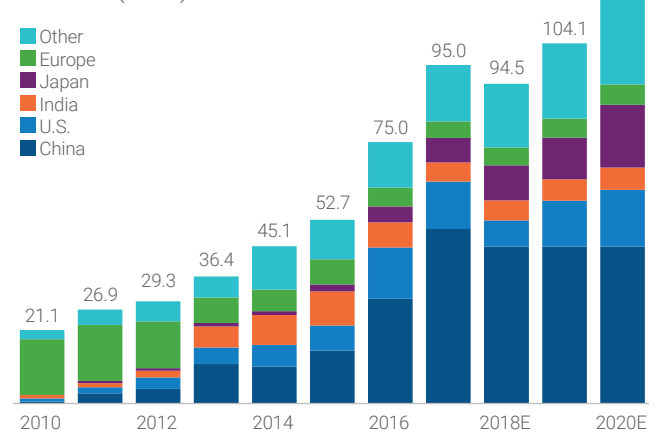
2020 share of global electricity generation



Source: Government data, EIA, BP Statistical, IHS, GTM/SEIA, company data, UN Environmental Programme Credit Suisse estimates.

While supply is increasing, demand for solar does not seem to be slowing. The following chart from Credit Suisse shows the growth in annual solar demand from 2010 to 2020.

Annual Solar Demand, Credit Suisse Estimates



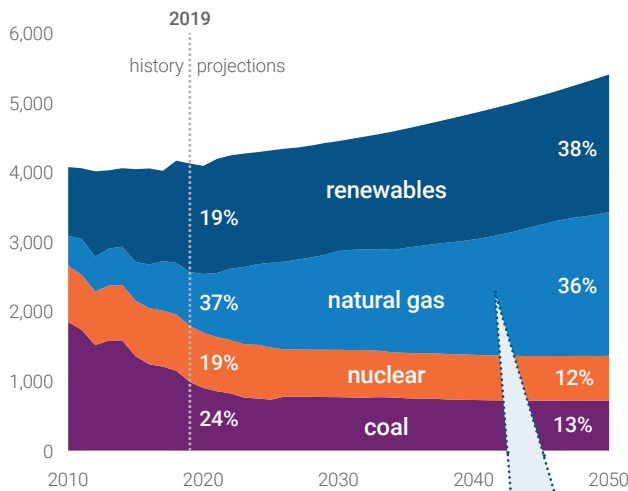
Source: Company data, Credit Suisse estimates.



According to a report issued in March 2020 by the U.S. Federal Energy Regulatory Commission (FERC), the mix of renewable energy sources alone (i.e., biomass, geothermal, hydropower, solar, wind) generated 57% of new U.S. electrical generating capacity added in 2019 – greatly outpacing that provided by coal, natural gas, oil and nuclear power combined. In the Electric Reliability Council of Texas (or ERCOT) region, which represents electricity flows and payments for roughly 85% of the state, 100% of new power in development is projected to come via new development in solar, wind and battery storage.⁴

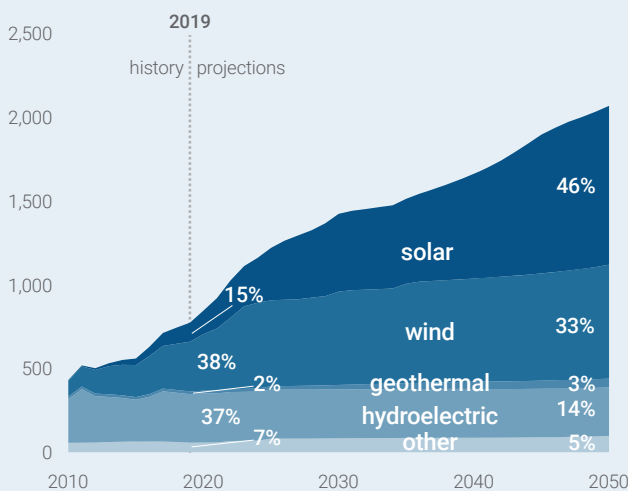
Electricity generation from selected fuels

Billion kilowatthours



Renewable electricity generation, including end use

Billion kilowatthours



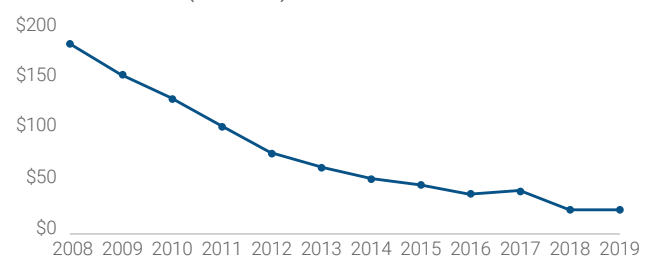
Source: U.S. Energy Information Administration, *Annual Energy Outlook 2020 (AEO2020)* Reference Case

One of the primary reasons we are seeing growth in renewables is a rapidly declining cost curve. While tax credits and subsidies have played a significant role in the development of the solar industry over the past several decades, the analysis below shows how the cost of wind and solar energy today is competitive with traditional fuel sources and is becoming even more affordable. According to Credit Suisse's data below, the purchase price of solar power per MW/Hr has declined over 70% for solar and wind from 2008 to 2019. Recent data suggests the decline has been even greater.

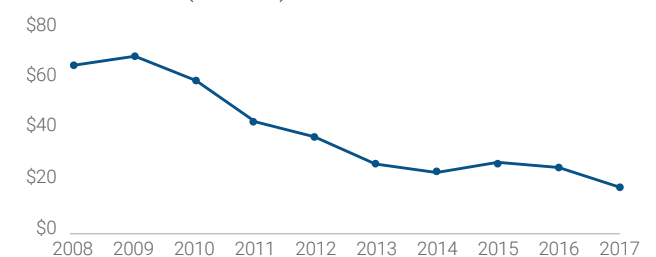
Renewables also have now surpassed 22% of the nation's total available installed generating capacity – further expanding their lead over coal capacity at 20%. Moreover, the U.S. FERC foresees renewables dramatically expanding their lead over fossil fuels and nuclear power in terms of new capacity additions in the next three years. Between now and the end of 2022, new wind capacity alone may be greater than that of natural gas, while that of wind and solar combined may more than double new gas capacity. If FERC's data proves correct, by the end of 2022, renewable sources will account for more than one-quarter of the nation's total available installed generating capacity, while coal will drop to 19% and nuclear and oil will decrease to 8% and 3%, respectively. Natural gas will remain roughly flat, at 44% of the nation's electricity generation.⁵

PPAs declined >70% in the U.S.

U.S. Solar PPA (\$/MWh)



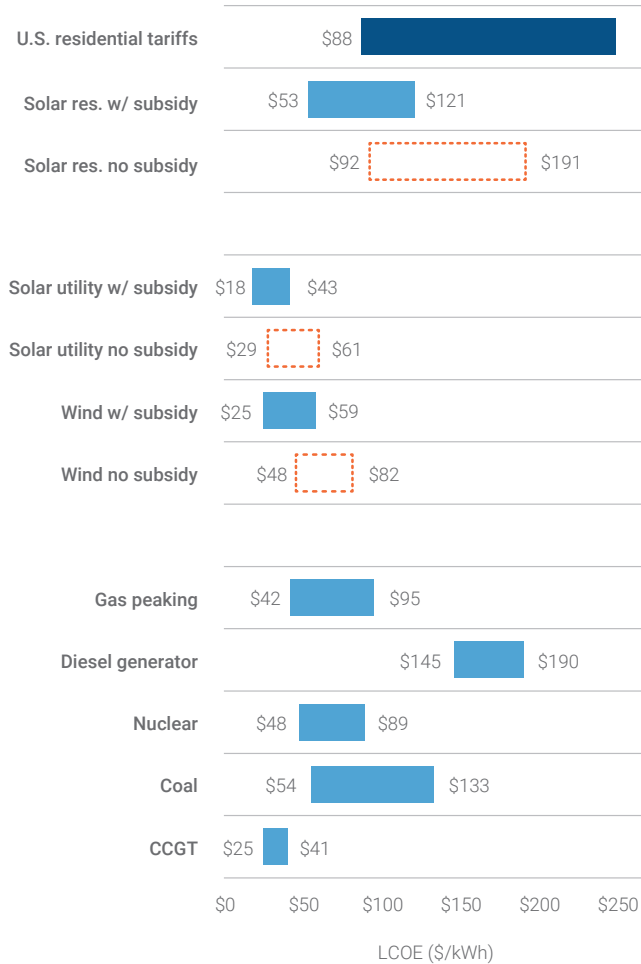
U.S. Wind PPA (\$/MWh)



Source: IEA, EIA, Eurostat, Company data, Credit Suisse Research.



Renewables are cost competitive versus traditional energy



Source: IEA, EIA, Eurostat, Company data, Credit Suisse Research.

But wait! Before you reallocate your portfolio into renewables, consider some of the challenges:

- Capital is flooding into the lower-risk areas within this sector, driving down returns.
- The industry infrastructure is not currently set up for a large influx of renewables.
- Competing cost curves, commodity cyclical, regulation and global disruption all bring additional risk to investing directly into large-scale renewable projects.
- Renewables are non-dispatchable and require significant infrastructure to be utilized at their full capacity.

- States, including California, have had to curtail wind, and solar generation, as they are unable to match supply and demand due to infrastructure constraints and lack of storability.

Despite these challenges, we do see a clear trend underway and believe this will spur attractive investment to support the needs of the emerging renewable power sources across a broad spectrum of opportunities around the renewable and electrification theme.

So, what are investors to do with this information? It's time to think more carefully about how your portfolio is exposed to both the opportunities and the risks of this energy transition.

We believe that there will be significant capital flows and focus into tangential areas that emerge from this part of the sustainability theme, and change will happen quickly, perhaps faster even than projected. McKinsey's 2019 Global Energy Report predicted that global energy demand growth will plateau by 2035 despite continued economic growth—an extraordinary decoupling.⁶

Ultimately, as electricity prices drop, use of renewable electricity in sectors such as passenger vehicles and space heating will increase, and even in industrial uses, spawning a wave of electrification. Scaling of the electrification as a power source is projected to be spurred in large part by electrification of vehicles. A complete conversion to electric vehicles is still 10 years or more away, but the process is taking place now. Over time, the broader electricity network will adapt to renewables and their characteristics, and a massive amount of demand will exist to meet the growing needs around the electrification market, from vehicles to batteries. This larger macro shift will drive an abundance of opportunity across the products and services that support this transition.

We've thrown a lot of information at you, but to summarize: The expectation is that renewable energy continues to become more affordable and will account for 50% of the energy supply by 2035, driving a wave of electrification and replacement energy sources. Perhaps even more important to consider is how this energy transition attracts capital away from previous conventional energy sources, upending the order and competitive advantages of some of today's leading businesses. Simply put, the energy transition may impact your entire portfolio, whether or not you choose to participate actively in the growth areas driving the opportunity.



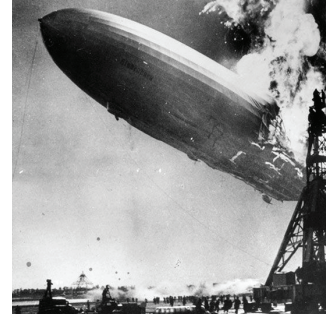
Private capital will be necessary to develop more efficient grid systems, create better energy storage, and sell and manage this electricity to grids, factories, homes, buses, trains and cars. And where capital is needed, GPs will go.

The Broader Sustainability Wave & Innovation

Hamilton Lane sits at a unique vantage point in the private markets, allowing us to see capital flows accelerate towards areas of maximum opportunity. Capital is always seeking more efficient and robust solutions and the sustainable investment trend, at its core, is driven by innovation and broad advances in technology seeking greater efficiency. Incumbent forces often keep traditional products and services in place, even as better alternatives exist. Short-term solutions and supply chains built over the past century create challenges for emerging technologies.

But today, rapid advances in software and sensors, and better access to information, are also driving higher expectations. We are seeing these changes in sectors that range from packaging to electricity distribution, where low-tech, less sustainable options are being disrupted by more efficient, data-rich solutions. Demand for cheaper, more durable, cleaner sources of energy has existed for a long time, but, like solar and wind, many of these solutions are becoming more cost effective, and with better data tools, can bring additional value.

Historically, the private markets have thrived during periods of change. These pockets of dislocation are the times when the best general partners find opportunities to innovate, look around corners and separate themselves from the pack. Sometimes it does take a crisis, like a flood or a pandemic, or the fiery crash of a helium-filled balloon, to recognize the inherent limitations of one technology and the dawning of a new industrial era. As we look beyond 2020, it's likely that many of the social, environmental and technological trends that began before the pandemic will continue—or even accelerate. We believe the secular shift around sustainability is one of those long-term themes.



The Great Flood of 1927 was an environmental tragedy that we hope never repeats. Whether facing a natural disaster or investing for the future, the ability to know when to abandon failing strategies for ones that are more effective and sustainable is crucial, but easier said than done. With durable trends like sustainability, it's best to allocate capital ahead of the curve, before it's too late. Or, in the immortal words of Memphis Minnie:

*"Cryin' won't help you, prayin' won't do you no good
Now cryin' won't help you, prayin' won't do you no good
When the Levee breaks, mamma you got to move."*



¹ U.S. Sustainable Investment Forum 2018 Report

² Hamilton Lane Data

³ Credit Suisse's Alternative Energy Report

^{4,5} U.S. Federal Energy Regulatory Commission (FERC), March 2020 Report

⁶ McKinsey's 2019 Global Energy Report

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