

Three Climate Tipping Points Shaping Markets Today

SOLUTIONS & MULTI-ASSET | GLOBAL BALANCED RISK CONTROL | MACRO INSIGHT | FEBRUARY 2019

Climate change research generally examines “tipping points” or critical thresholds that, once breached, could accelerate the pace of change. But even today, we are approaching many tipping points that cannot be ignored. They are playing out not only in the environment, but also in political, social, economic and investment realms.

Tipping point #1: Political

We are edging ever closer to the political tipping point. Reaching it will be important if we are to mitigate the effects of climate change. Recently, a number of reports gained attention for their updated predictions and proved rather sobering:

- A 2018 IPCC report¹ concluded that the threat of climate change is so significant and so immediate that we have just 12 years to make unprecedented changes to keep global warming to less than 1.5°C above pre-industrial levels. Above this level, the consequences are predicted to be far reaching and catastrophic.
- The UN Emissions Gap Report 2018 highlighted “there is an enormous gap between what we need to do and what we’re actually doing to prevent dangerous levels of climate change”.²

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“We choose to go to the moon . . . because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win.”

— John F. Kennedy

¹ Intergovernmental Panel on Climate Change (IPCC) Special Report: Global Warming of 1.5°C. www.ipcc.ch/sr15/.

² www.unenvironment.org/interactive/emissions-gap-report/ See also: United Nations Environment Programme (UNEP 2018). The Emissions Gap Report 2018. United Nations Environment Programme, Nairobi.



Display 1 plots the projected global greenhouse gas (GHG) emissions under various scenarios; we are predicted to overshoot the 1.5°C goal if we do not do more to reduce emissions.

Governments' responses show many are burying their heads in the sand. During the December 2018 UN Climate Conference the U.S., Russia, Kuwait and Saudi Arabia argued that the IPCC report should not be "welcomed", but merely "noted". While the headlines surrounding the November 2018 White House report³ focused on the potential reductions in U.S. GDP by 2100, President Trump expressed scepticism. Either way, any potential curtailment of GDP should make investors and citizens sit up and take notice.

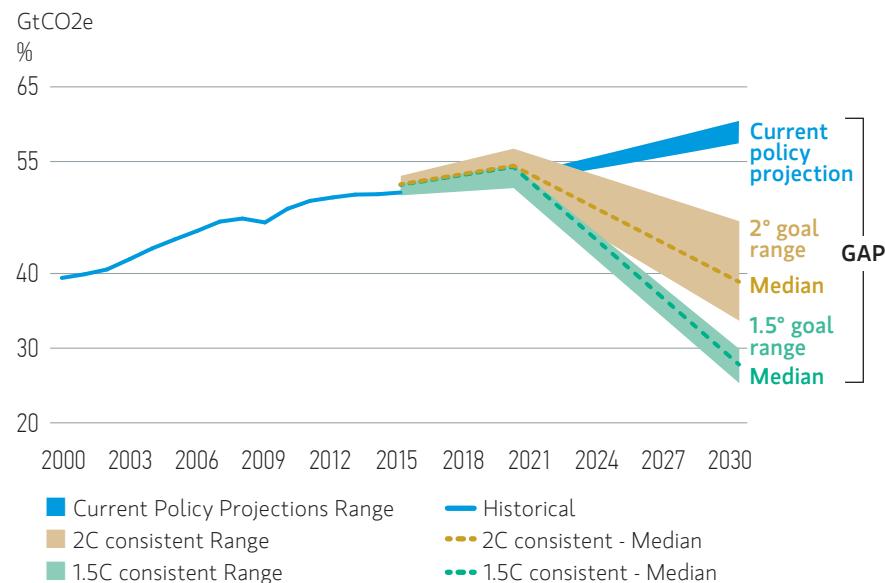
Until now, many governments and politicians have largely ignored their responsibility to proactively deal with the challenge of climate change. We think mounting pressure from bodies such as the UN, as well as from better informed citizens may now be moving us towards another tipping point, which would mark a shift in attitudes and priorities.

Tipping point #2: Social

What if we just do nothing? The consequences of inaction are potentially severe: floods, droughts, fires, hurricanes, snowstorms and the hottest summers on record are already increasing mortality rates and creating havoc for industries and people. This is likely to exacerbate social tensions and could lead to further frictions and polarisation within society, as different regions and segments of the population are disproportionately affected. Emerging markets, being less able to adapt to climate-related changes, will likely suffer the most.

Entire islands are being swallowed by rising sea levels. The island Republic of Kiribati in the Pacific Ocean has bought land in Fiji to relocate its citizens, due to rising seas. Yet

DISPLAY 1 2030 emissions gap between current policy and 1.5°C/ 2°C scenarios



Source: Climate Action Tracker (CAT 2018) cited in the United Nations Environment Programme (UNEP 2018). The Emissions Gap Report 2018. United Nations Environment Programme, Nairobi Global GHG emissions under different scenarios and the emissions gap in 2030. The current policy scenario estimates future global GHG emissions, assuming that all currently adopted and implemented policies have been realised and no additional measures are taken. GtCO₂e is carbon dioxide equivalency. Forecasts/estimates are based on current market conditions, subject to change, and may not necessarily come to pass.

Fiji, itself is under threat, relocating coastal villages inland. These are not the only climate refugees. On a much longer term horizon, the World Bank estimates that climate change could ultimately lead to 140 million internal migrants in Sub-Saharan Africa, South Asia and Latin America.⁴

Some governments have also been facing pressure. Protests around the world, calling for action on global warming, have intensified, but social unrest related to climate change is complicated. In France, the populist 'gilets jaunes' movement began as a protest against rising fuel taxes, which the government had intended to help fulfill its commitments to tackle climate change under the Paris Climate Agreement. This led to a counter

movement by the 'red scarves' who are demanding an end to the violence. Ultimately, the social unrest led to President Macron abandoning the policy. We have been factoring in these French protests in our investment considerations due to the political instability and its potential impact on European GDP.

Clearly, the climate-related social tipping point presents social divisions. Not addressing climate change can lead to outcries for action, yet addressing climate change can cause hardships that lead to protests, such as the 'gilets jaunes' movement. Doing nothing may delay unrest briefly, but climate change will ultimately increase suffering, climate refugees and social unrest regardless.

³ Fourth National Climate Assessment, Impacts, Risks, and Adaption in the United States. November 2018. Published by the U.S. Government's Global Change Research Program (USGCRP).

⁴ "Climate Change Could Force Over 140 Million to Migrate Within Countries by 2050: World Bank Report", World Bank Group 2018. www.worldbank.org/en/news/press-release/2018/03/19/climate-change-could-force-over-140-million-to-migrate-within-countries-by-2050-world-bank-report.

Tipping point #3: Economic

When it comes to economic tipping points, in many ways the future is already here. The cost of renewable energy has fallen dramatically in many parts of the world. In the U.S. solar and wind energy are \$54 and \$51 per megawatt hour respectively (*Display 2*) which is now a competitive relative to coal at \$66 per megawatt hour. Both are less than a third of the cost of nuclear, though for now gas still remains the least expensive source of energy.

Subsidies and low borrowing costs for the initial required capital expenditure have helped solar and wind growth. However, with rising interest rates led by the U.S., and the majority of energy investment outside the U.S. being U.S. dollar-denominated, we will need government policies to support further growth. The International Energy Agency (IEA) is predicting 70% of future global energy investments will be government-driven.⁵ Clearly, we are seeing a significant shift in energy production, with a notable increase in renewable energy (*Display 3*).

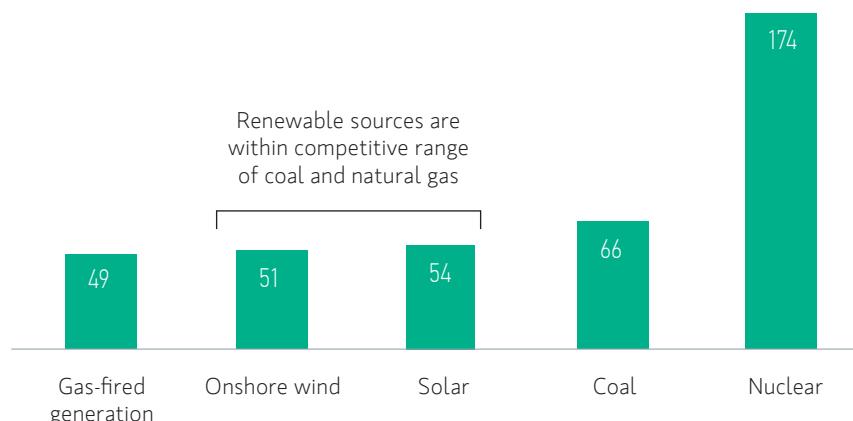
We should also consider the technological advances associated with renewables. There are increasing numbers of electric vehicles (EVs), which are getting cheaper, while offering a greater range of choices. EVs are also more energy efficient and therefore emit less GHGs than internal combustion engines, even if the electrical energy source is from a fossil-fuel. However, EVs require batteries, which have low energy density and are heavy.

For applications that require high energy density,⁶ like lorries, hydrogen has the potential to emerge as a complementary technology. It would require a significant build-out of infrastructure, but Japan, China and California are increasingly competing in this space. Japan, in particular, has been investing heavily

DISPLAY 2

The future is here

Average levelised cost of electricity in the U.S. without subsidy for 2017 (\$ per megawatt hour)

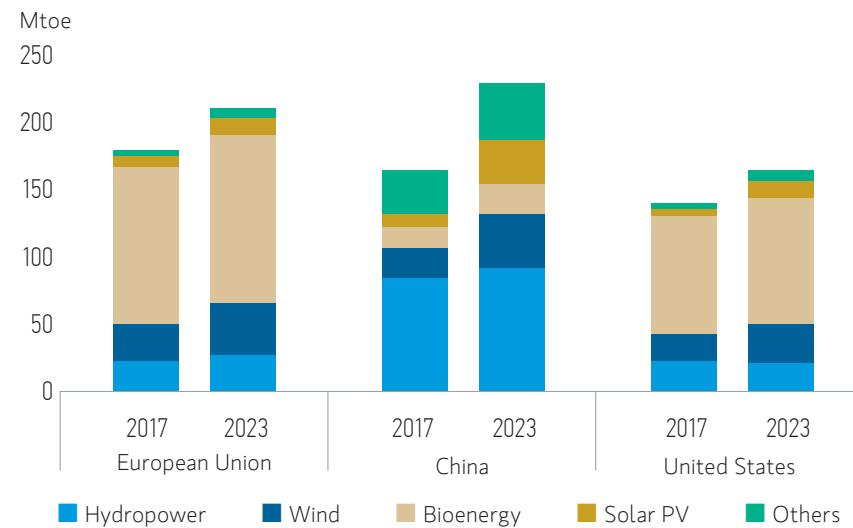


Data source: Global Trends in Renewable Energy Investment 2018, Frankfurt School - United Nations Environment Programme (UNEP) Collaborating Centre. \$MWh indicates the US dollar cost per megawatt hour of energy.

DISPLAY 3

Who are the biggest consumers of renewable energy?

Renewable energy consumption in major markets, 2017 and 2023



www.iea.org/renewables2018/ Published 8 October 2018. The share of renewables in total final energy consumption in the European Union is calculated using the methodology outlined in IBRD World Bank and IEA (2015), Global Tracking Framework (GTF) 2015. The exact calculation and inclusion of specific energy flows may differ from those outlined in the EU Directive 2009/28/EC. Mtoe is million tonnes of oil equivalent.

⁵ International Energy Agency (IEA) www.iea.org/newsroom/news/2018/november/world-energy-outlook-2018-examines-future-patterns-of-global-energy-system-at-a-t.html.

⁶ Energy density is the amount of energy stored for a given mass.

in hydrogen. Toyota and Honda are leading the way in hydrogen fuel cell cars. In support of Japan's push to lead the world as a "Hydrogen Society," these advancements are planned to be showcased during the 2020 Tokyo Olympics.

Hydrogen also potentially offers a solution to balance the power grid, a challenge with which Beijing has had to contend. A weakness of electricity generated by renewable energy is that it tends to come in surges, with big windstorms or a long spell of sunny days. Other issues include the cost of large-scale batteries and the fast rate at which their energy depletes. Instead of wasting the excess electricity available during these intermittent surges, it could be used to split water into hydrogen, which can be stored in great quantities for long periods. That said, hydrogen does have its own challenges, as it is less efficient given the energy required to both create and store it.

A final point worth noting is that while China is widely known to be the world's largest coal consumer, it also leads new investment in renewables (*Display 4*). In fact China is already dominating in every area of new energies and had the most EVs in 2017 – 40% of the global stock.⁷

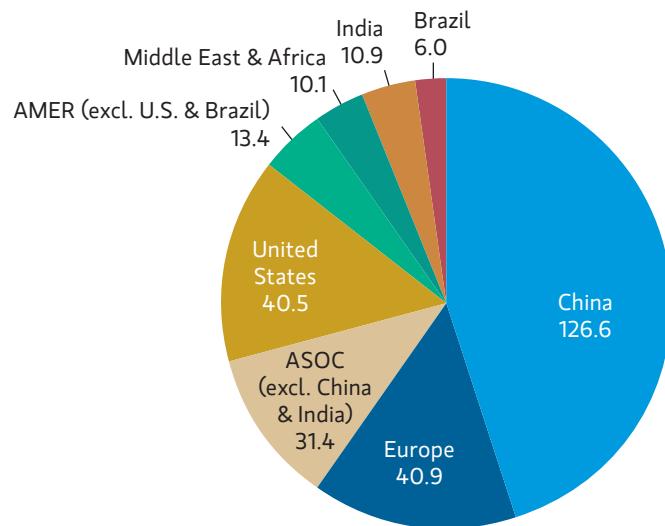
Investor demand and implications

As these political, social and economic tipping points bring disruptive changes in the energy and auto sectors across different regions, the question becomes, "How should investors respond?" Enough are asking that question to drive markets to a fourth tipping point: investor demand. Within the last few years, investors have been increasingly demanding greater incorporation of environmental, social and governance (ESG) considerations in their investments.

While fossil-fuel companies clearly face direct headwinds, the impact on other sectors should not be ignored.

DISPLAY 4 China, the world's largest coal consumer also leads new investment in renewables

Global New Investment in Renewable Energy by Region, 2017, \$bn



Source: Global Trends in Renewable Energy Investment 2018, Frankfurt School - United Nations Environment Programme (UNEP) Collaborating Centre. New investment volume adjusts for re-invested equity. Total values include estimates for undisclosed deals.

The insurance industry, which is facing greater risks of loss from floods and hurricanes, is also subject to potential legal risks. For example, if future regulations deem oil companies to be liable for their contributions to climate change, there is an argument that this is a general liability matter, for which oil companies already have insurance against damaging lawsuits and penalties.

Climate change related issues can increase political uncertainty and have implications across a portfolio's broad asset allocation. Investors should consider this factor during the asset allocation process. For instance, the 'gilets jeunes' movement contributed to the already heightened political uncertainty in Europe in 2018.

Within sectors, we believe, it is worth differentiating between companies. For

example, within the energy sector, it makes sense to distinguish between oil and gas companies with poor climate risk management and those with stronger ESG scores.⁸ One solution we have found to address this, while preserving global diversification, is to remain sector neutral. We do this by keeping sector weights in line with those of the equity indices that we follow but, within those sectors, tilting our portfolio holdings towards, higher scoring, more ESG-friendly companies.

Climate change: Not just a long-term problem

The current U.S. President withdrew the U.S. from the Paris Climate Agreement and has at times denied the threat of climate change. Therefore, the U.S. government's response to climate change, as with that of many other governments, has been insufficient.

⁷ International Energy Agency (IEA), Global EV Market Outlook 2018.

⁸ The Global Balanced Risk Control team uses ratings data from Sustainalytics, a specialist in sustainability research and analysis.

However, across the rest of the world there are some who are beginning to participate in the green race in a way that echoes a former U.S. president, John F. Kennedy's, exhortation of urgency for American leadership in a different race. In a speech that marked a tipping point in the Apollo space programme, JFK rallied the nation: "We choose to go to

the moon. . . because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."

Many are starting to realise that the need to tackle climate change is an issue that can no longer be postponed. We have reached a number of tipping points

already: political, social, economic and investment. There is no need to wait a century or a decade to see the effects. The consequences are unfolding right now across the planet. Investors should be taking advantage of the opportunities presented by these disruptions, while protecting their portfolios from the adverse consequences.

Risk Considerations

There is no assurance that the strategy will achieve its investment objective. Portfolios are subject to market risk, which is the possibility that the market values of securities owned by the portfolio will decline and that the value of portfolio shares may therefore be less than what you paid for them. Accordingly, you can lose money investing in this portfolio. Please be aware that this strategy may be subject to certain additional risks. There is the risk that the Adviser's **asset allocation methodology and assumptions** regarding the Underlying Portfolios may be incorrect in light of actual market conditions and the portfolio may not achieve its investment objective. Share prices also tend to be volatile and there is a significant possibility of loss. The portfolio's investments in **commodity-linked** notes involve substantial risks, including risk of loss of a significant portion of their principal value. In addition to commodity risk, they may be subject to additional special risks, such as risk of loss of interest and principal, lack of secondary market and risk of greater volatility, that do not affect traditional equity and debt securities. **Currency fluctuations** could erase investment gains or add to investment losses. **Fixed-income securities** are subject to the ability of an issuer to make timely principal and interest payments (credit risk), changes in interest rates (interest-rate risk), the creditworthiness of the issuer and general market liquidity (market risk). In a rising interest-rate environment, bond prices may fall. In general, equities securities' values also fluctuate in response to activities specific to a company. Investments in **foreign markets** entail special risks such as currency, political, economic, and market risks. **Stocks of small-capitalisation companies** carry special risks, such as limited product lines, markets and financial resources, and greater market volatility than securities of larger, more established companies. The risks of investing in **emerging market countries** are greater than risks associated with investments in foreign developed markets. **Exchange traded funds (ETFs) shares** have many of the same risks as direct investments in common stocks or bonds and their market value will fluctuate as the value of the underlying index does. By investing in exchange traded funds ETFs and other Investment Funds, the portfolio absorbs both its own expenses and those of the ETFs and Investment Funds it invests in. Supply and demand for ETFs and **Investment Funds** may not be correlated to that of the underlying securities. **Derivative instruments** can be illiquid, may disproportionately increase losses and may have a potentially large negative impact on the portfolio's performance. The use of **leverage** may increase volatility in the Portfolio. **Diversification** does not protect you against a loss in a particular market; however, it allows you to spread that risk across various asset classes.

DEFINITIONS

A **currency forward** is a hedging tool that does not involve any upfront payment. **Gilets Jaunes Movement:** The Gilets Jaunes Movement began in November 2018, when thousands of people across France spontaneously organised to block roads and the roundabouts that lead into nearly every town in France, dressed in their yellow motorist's vests, in order to protest a planned hike in taxes on diesel fuel. The **International Bank for Reconstruction and Development (IBRD)**, commonly referred to as the **World Bank**, is an international financial institution whose purposes include assisting the development of its member nation's territories, promoting and supplementing private foreign investment and promoting long-range balance growth in international trade.

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