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The Impact of High Interest Rates on Sustainable Investments



Sustainability Research Paper

The Al-Attiyah Foundation



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This paper analyses the impact of rising interest rates on sustainable investments and aims at answering the following questions:

- How sensitive are sustainable investments to interest rate changes compared to non-sustainable investments?
- What role did low interest rates play in the growth of sustainable investments in the past decade?
- Do rising interest rates pose a threat to further growth of sustainable investments and the low-carbon transition?
- What policy measures can be implemented to cushion the effect of rising interest rates on sustainable investments?

SUSTAINABILITY RESEARCH PAPER

This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a current sustainability topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners, and universities, as well as made available on the Foundation's website.



- Sustainable investments are investments that seek to achieve a financial return while also generating positive effects on society, the environment, and the economy. Given the amplified focus on decarbonisation and green economy, sustainable investments are becoming increasingly attractive and are crucial to enable the low-carbon transition.
- Interest, i.e., the price of capital, is a key parameter for investment decisions. The higher the interest, the lower the incentive to invest, and vice versa. Generally, the interest rate demanded by capital providers depends on the perceived risk of the investment – the higher the perceived risk, the higher the interest rates.
- Sustainable investments are typically more capital intensive than unsustainable ones as they involve expensive advanced technologies, and often require ancillary infrastructure. This means that sustainable investments will generally be more sensitive to interest rate changes compared to traditional less capital-intensive unsustainable investments.
- Following the financial crisis of 2008, low interest rates have driven sustainable investments such as, for example, investments in wind and solar energy. Most of these investments concentrated in developed economies due to their low-risk environment and hence lower interest rates than on the global average.
- The COVID-19 pandemic and Ukraine war have collectively contributed to the rise in inflation and subsequent interest rates. Disruption to global supply chains caused prices for materials, energy and food grains to rise, which was further aggravated by Western Europe's decision to reduce imports of Russian oil and gas.
- Rapid increases in interest rates have the potential to slow down sustainable investments and the low-carbon transition, although the scale of that effect remains uncertain.
- Policy measures could be introduced to cushion the detrimental effects of high interest rates on sustainable investments. For example, central banks could differentiate interest rates based on the investment type and the provision of government guarantees could help de-risk investments.





Historically low interest rates have dominated the economic landscape over the past decade which is unprecedented in economic history. This was due to the response to the 2008 financial crisis which encouraged financial institutions to lower interest rates to record levels and flood the market with money to encourage people to spend and revive the economy. Sustainable investments such as, for example, renewable power generation benefitted from this particularly, with deployment rates doubling from roughly 100 GW per year on average in 2009-2014 to roughly 200 GW per year on average in 2015-2020¹.

However, the COVID-19 pandemic has caused the greatest supply-chain disruption in the 21st century, with subsequent sanctions imposed by the US and Western allies in response to the Ukraine war amplifying the rising cost of living and causing interest rates to rise exponentially.

In early 2022, a combination of circumstances then led to the sudden breakout of inflation not seen since the Second World War. The move out of the pandemic in all countries except China led to a significant increase in consumer spending, given the “pent up” demand from the two years of pandemic. At the same time, the supply chain is still disrupted from the pandemic, and material costs are on the rise. Taken together, these factors have created an unfavourable climate for sustainable investment due to rising interest rates, but it remains unclear how higher interest rates will impact investments going forward. Among other things, this may depend on whether governments implement dedicated policies to cushion the detrimental effects of rising interest rates.



Interest, i.e., the price of capital, is a key parameter for investment decisions. As a rule of thumb, the internal rate of return (IRR) of an investment must be higher than the interest rate to make it economically attractive. The higher the interest, the lower the incentive to invest, and vice versa. Generally, the interest rate demanded by capital providers depends on the perceived risk of the investment – the higher the perceived risk, the higher the interest rates. Therefore, the required return on equity, which entails higher risk, is generally higher than the interest on a loan, which entails lower risk. Similarly, the higher the credit rating of a borrowing entity, the lower the risk, hence the lower the interest rate. For example, countries enjoying an AAA credit rating – as most developed countries do – pay a lower interest on public debt than countries

with a low credit rating, which in turn increases the spending power of their governments. On a national level, central banks set the so-called refinancing or base rates, which essentially act as the floor interest rate for commercial banks.

Sustainable investments are investments that seek to achieve a financial return while also generating positive effects on society, the environment, and the economy. As a minimum, they want to prevent negative social, environmental, and governance (ESG) impacts. Sustainable investments can include a wide range of activities, including renewable energy generation, energy efficiency improvement, forest conservation etc. and related strategies for directing funds towards these activities, such as impact investing, integration of ESG factors, norms-based screening, etc.

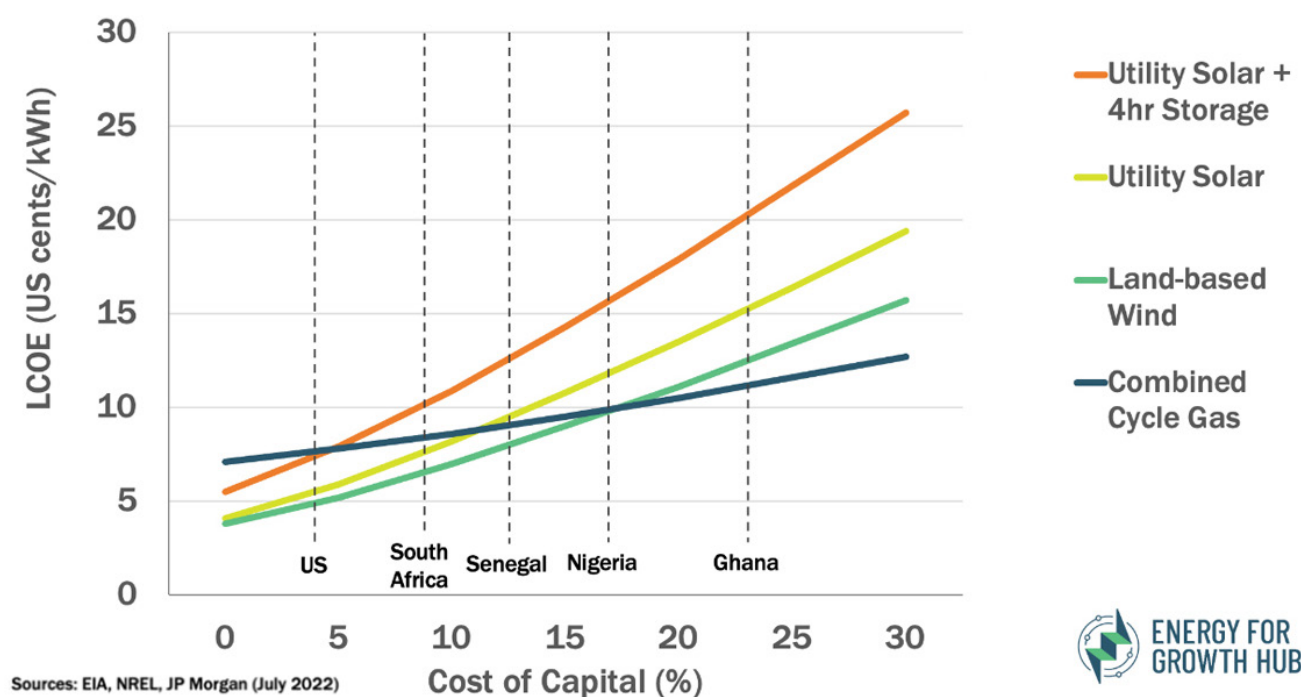
Many studies show a positive correlation between the sustainability of investments and their returns^{2,3}, which makes them an increasingly attractive investment. However sustainable investments are typically more capital intensive as they involve expensive advanced technologies, and often require ancillary infrastructure. This means that sustainable investments will generally be more sensitive to interest rate changes compared to traditional non-sustainable investments.

To illustrate this phenomenon, consider investments in power generation from renewables compared to fossil fuels. Renewable energy is very capital intensive as except for hydropower, it does not come in concentrated form. Therefore, large numbers of wind turbines and solar photovoltaic (PV) panels must be built

to achieve the power generation capacity that a relatively small coal power plant can generate. In contrast, the operating costs of renewable power plants are relatively low as the energy input is "free" while fossil-based power plants need to constantly purchase fuels. Upfront capital investments therefore have a higher share in the overall lifetime cost of the project for renewables compared to fossil fuels. Indeed, the levelized cost of electricity (LCOE) – a measure of cost of a unit of electricity calculated over the lifetime of a project – tends to increase sharply with increasing interest rates for renewables, while for fossil-based generation the increase is not as steep (see Figure 1). In other words, an increase in interest rates makes investments in renewables less attractive than in fossil-based electricity generation⁴.

Figure 1. Impact of the cost of capital on the levelized cost of electricity (LCOE) from different technologies⁵

Interest Rate Effects on Energy Costs





The last decade has seen historically low interest rates, a period that is an outlier in economic history. Following the financial crisis of 2008, central banks around the world took steps to prop up their economies, including reducing interest rates to historic lows and flooding the market with money. Lower interest rates make borrowing easier and thus help stimulate the economy, which has always been a goal of central banks during times of economic crisis. By keeping interest rates low, people and businesses have a stronger incentive to spend and borrow which helps maintain steadier economic growth. After 2008, for the first time, nominally negative interest rates have been observed, meaning that a borrower got paid for taking a loan.

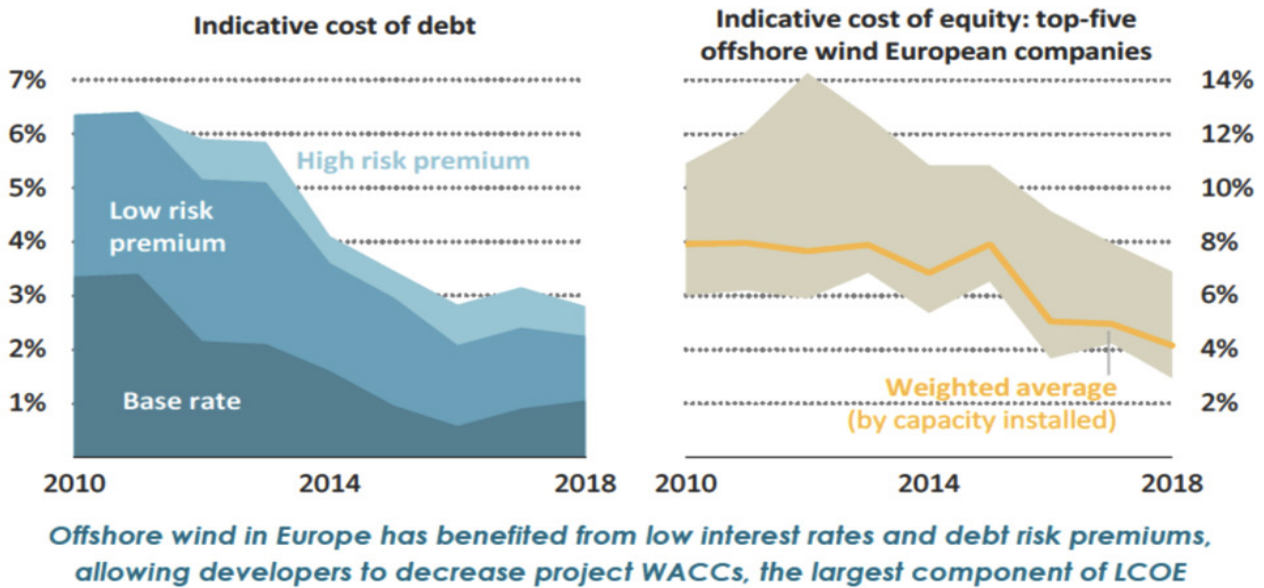
As explained above, this period of extremely low interest rates was highly favourable to sustainable investments, as all categories saw massive increases. For example, annual wind power technology investment doubled from 73 billion USD in 2009 to 143 billion in 2019⁶, while all kinds of renewable energy together grew from 147 billion USD to 282 billion⁷. Investments in renewables, energy storage and transmission now account for over 80% of all investments in the power sector⁸.

Government subsidies, which were ubiquitous at the start of the period, were no longer required in many countries as renewable power was able to underbid fossil fuel power in auctions for power plant expansion. The low capital cost due to the low interest rates was a critical factor in the dramatic decline in

the cost of these technologies⁹, as well as the reduction of perceived risk. The International Energy Agency (IEA) emphasized that the European offshore wind sector had “benefited from low interest rates and debt risk premiums, allowing developers to decrease project weighted average cost of capital¹⁰” (see Figure 2) – a finding that was also found by academic analysis looking at historical data on German onshore wind and solar PV¹¹.

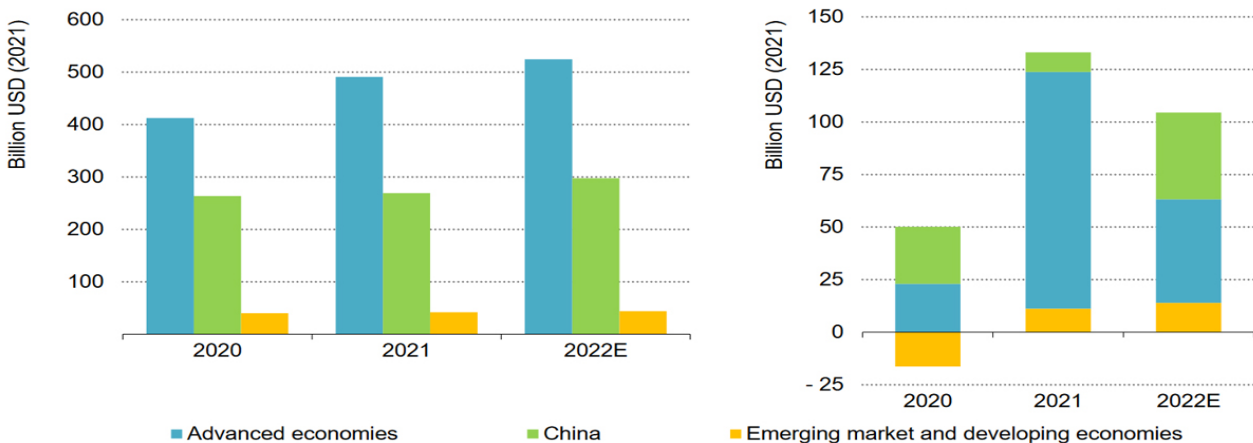
The role of low interest rates to drive sustainable investing is also shown by the distribution of such investments, with the industrialized countries dominating due to their low interest rate and low risk environment, while most emerging economies and developing countries featured higher interest rates and risk premia. China, which has seen its interest rates align with industrialized countries due to a “savings glut” sits between both categories (Figure 3).

Figure 2. Cost of debt and equity for offshore wind investments in Europe¹²



Note: WACC = weighted average cost of capital; LCOE = levelised cost of electricity.

Figure 3. Per capita clean energy investment (left) and annual change in clean energy investment (right) by region¹³



09 WILL THE INTEREST RATES SHOCK LEAD TO A DOWNTURN IN SUSTAINABLE INVESTMENTS?

The COVID-19 crisis led to massive disruptions in global supply chains that were impacted by lockdowns, travel limits and supply shortages. For the first time in over a decade real cost pressure was built up on the goods supply side. At the same time, the COVID-19 pandemic led to huge government support programmes to prevent company bankruptcies and a depression style deflation. This led to huge increases in money supply that were initially unproblematic due to a lacking willingness of consumers to spend in the context of pandemic uncertainty. In early 2022, a combination of circumstances then led to the sudden breakout of inflation not seen since the Second World War. The move out of the pandemic in all countries except China led to a significant increase in consumer spending, given the "pent up" demand from the two years of pandemic. The velocity of money increased from the extremely low values that had characterized the 2009-2020 period. At the same time, the supply chain is still disrupted from the pandemic, and material costs are on the rise. The Ukraine war was then a trigger for all-out inflation through massive increases in prices of energy and key food grains, partially driven by unprecedented measures by Western Europe to reduce its imports of Russian oil and gas¹⁴. In late 2022 inflation reached 10% in key industrialized countries and up to 100% in emerging economies (e.g., Turkey), even Switzerland as haven of stability exceeded 3%. For the first time in many decades, inflationary expectations are pervasive throughout the economy and pressure to increase salaries is high. For example, the UK has been suffering "winter strikes" since December 2022 across a range of sectors including healthcare, transport, postal services, and schools.

As a response to these developments, central banks have massively raised their interest rates and the era of negative interest is definitely over. The US Federal Reserve hiked rates seven times in 2022, now at 4.25% to 4.50%¹⁵; the Bank of England increased rates five times; while the European Central Bank interest reached 2.5% in Dec 2022^{16 17}. Many governments that had massively borrowed during the period of low interest rates given that borrowing costs were essentially zero are now struggling with the increasing burden of their debt as inflation and interest rates are surging leading to the first government defaults, such as in the case of Ghana¹⁸.





The goldilocks period for sustainable investments is therefore over. But how much the rising interest rates will actually reduce such investments is not yet clear¹⁹. The IEA estimates that a 2% interest rate rise increases the overall LCOE for wind and solar by 20%²⁰. Researchers at ETH Zurich calculated that an increase of interest rates in Germany to pre-financial crisis levels could add 11% and 25% to the LCOE for solar and wind, respectively²¹. In India, the power price per kWh of winning bids for solar photovoltaic auctions has already increased by 22% between late 2020 and May 2022²² and reached the 2019 value at the end of the year²³. Wind power price in Indian bids increased by 5.5% in 2022²⁴. Indian solar power developers complained about a 50% increase in costs of domestically produced solar panels in 2022²⁵. Investments in energy efficiency, e.g., for buildings renovation and retrofitting could be affected particularly strongly because they are not only hit by the interest rate increase. The inflation has led to high increases of building material costs and

makes real estate loans more expensive, leading to a reduced demand for renovations²⁶.

A differentiation between capital intensive and capital extensive sustainable investments may thus occur. The former will suffer while the latter may even increase if properly supported by governments. However, government subsidies for sustainable investments will become much more difficult to justify as governments will focus on those investment types that offer co-benefits such as energy security in the context of the energy crisis. Especially for renewable energy, subsidies have been phased out in many countries where renewables had reached cost parity with their fossil fuel counterparts²⁷. Reintroducing such subsidies as renewables again move away from the cost parity due to the interest rate increase will face strong barriers, especially as public budgets are squeezed due to increasing military expenses and rising cost for public debt.

11 POTENTIAL POLICY INSTRUMENTS TO CUSHION THE INTEREST RATE INCREASE

Various policy instruments to cushion detrimental effects of the interest rate increase on sustainable investments have been proposed including targeted, differentiated central bank interest rates, dedicated allocation of capital by central banks earmarked for lending to specific types of activities, differentiated capital requirements for private bank lending towards sustainable investments and general provision of government guarantees to reduce the risk premium of sustainable investments, as well as differentiated interest rates for loans of public finance institutions. None of these instruments has yet been applied on a significant scale though.

Central banks could differentiate interest rates, whereby low interest rates could be offered for sustainable investments, whereas high rates would be applicable to other investment types²⁸. The Japanese and Chinese central banks have provided quantity-based capital quotas to commercial banks earmarked for loans to specific sectors. However, while some central banks, e.g., the ECB, the Bank of England and the People's Bank of China have launched climate stress tests and green bond programmes, they have so far stopped short of fully integrating climate considerations in their monetary policies²⁹. Generally central banks have argued that their single target is monetary stability and that they should not become embroiled in government policies for climate change mitigation.

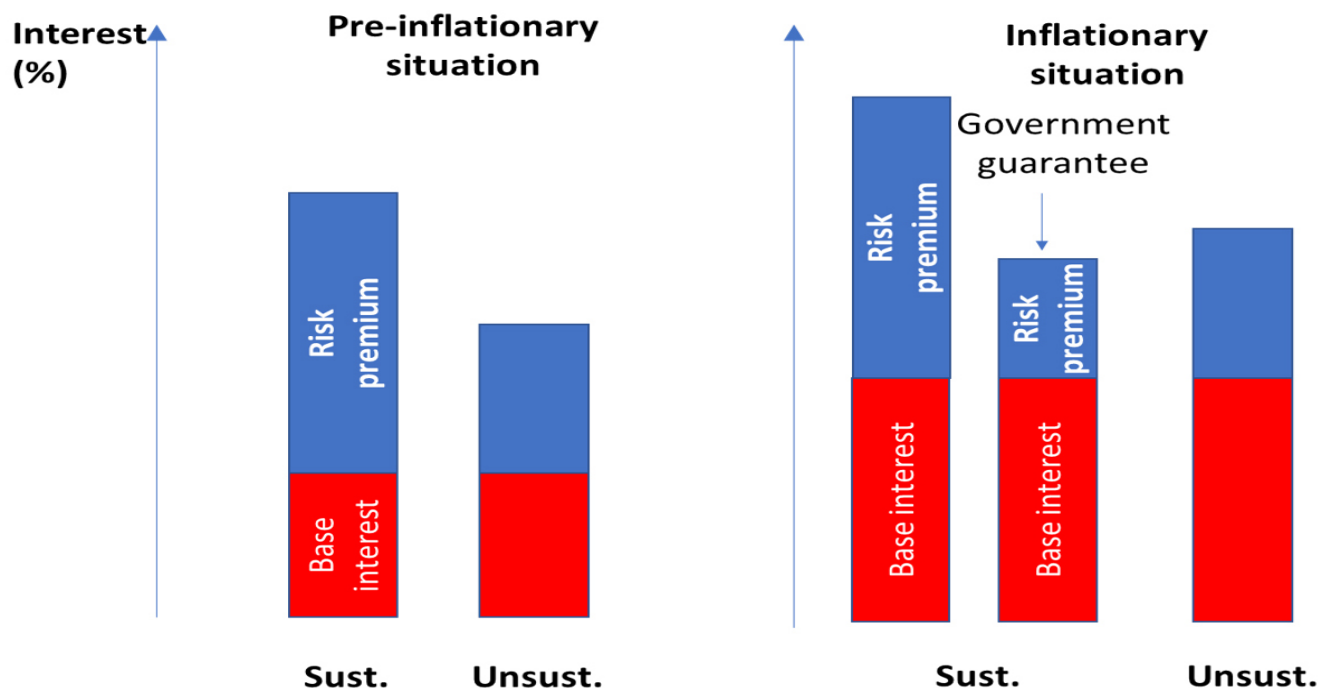
Capital reserve requirements for low-emitting assets at commercial banks could be reduced below those for unsustainable assets³⁰. The disadvantage of this idea is that a failure of debt service by the operators of sustainable investments could lead to a banking crisis and threaten the stability of the financial

system in its entirety. De-risking of sustainable investments through provision of government guarantees, especially in developing countries, could also help to cushion the effect of an overall increase of interest rates, (see Figure 4) below³¹.

In the pre-inflationary situation, the overall interest paid for debt of a sustainable investment is dominated by the risk premium; the risk premium of a competing unsustainable investment is lower, as well as total interest. As inflation hits and central banks raise their interest rates, the base interest rises. If now governments provide a guarantee for the sustainable investment, the risk premium is lowered and the overall interest of the sustainable investment falls below that of the unsustainable alternative. Generally, the disadvantages of this policy option are lower than of the other discussed policy instruments – the only risk is a cumulation of failures which lead to a high government pay-out to the lenders.

Lastly, public financing institutions such as multilateral development banks (MDBs), National Development Banks (NDBs) and Export Credit Agencies (ECAs) could allocate loans, insurance and guarantees to sustainable investment developers at preferential conditions. The disadvantage of this option is a revenue loss for the public banks.

Figure 4. Effect of government guarantees for offshore wind investment in Eur.



CONCLUSION

Rapid increases in interest rates as currently happening around the world have the potential to massively slow down sustainability investments and hence the low-carbon transition. They are particularly detrimental for technologies with high capital costs and low operational costs such as solar and wind power, where an interest rate increase of 2% may lead to a cost increase of up to 20%. While for some sectors such as renewable energy production, cost increases may be balanced out by higher sales prices, for other sustainable investments this may not be possible. Given that the rise in interest rates also reduces the availability of public resources to directly finance sustainable investments and related public policy instruments, the likelihood is low that effective policy instruments to counteract the

effect of the interest rate increase will actually be introduced. Central banks have been reluctant to embrace differentiated interest rates or targeted allocation of capital until now. The most promising policy instrument would probably be government guarantees for sustainable investments in order to bring down the risk premium and thus keep the cost of capital stable.

Unless public pressure to address the climate and biodiversity crisis is strong enough to direct increasingly scarce public resources towards sustainable investments, in the current environment of rapidly rising interest rates, sustainable investments will become significantly less attractive than they were in the last 15 years.

This will be more pronounced in developing countries and emerging economies with a high debt burden. An exception will be technologies with important co-benefits that are highly valued, in the current global situation of multiple crises, such as renewable energy and energy efficiency technologies and related infrastructures that contribute to national energy security and generate a high number of qualified jobs. Policymakers should already now prepare and introduce effective policy instruments to prevent a collapse of sustainable investment. The most promising instrument is targeted de-risking of such investments through government guarantees, followed by differentiated interest rates for capital made available by central banks to the private financial sector.

APPENDIX

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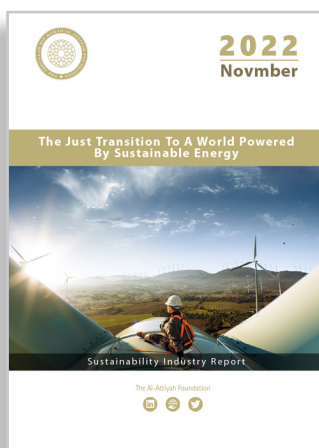


December - 2022 COP27: Taking Stock

Negotiations at COP27 revolved around the remaining prospects of avoiding a global temperature increase of 1.5°C; the provision of climate finance to assist developing countries to mitigate and adapt; and the establishment of new funding to compensate vulnerable countries for loss and damage.



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November - 2022 The Just Transition To A World Powered By Sustainable Energy

The energy transition will affect fossilfuel dependent countries, communities, and localities very differently. The financial flows from developed countries to developing countries have always been a thorny issue in climate change negotiations.



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October - 2022 Technology and Climate Change

There is general recognition that technological breakthroughs will play a key role in climate change mitigation and adaptation. New technologies are required to expand the scope of low-carbon energy, facilitate atmospheric carbon removal, tackle hard-to-abate sectors, and deal with the unavoidable impacts.





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