

Special Report  
**Greenflation**

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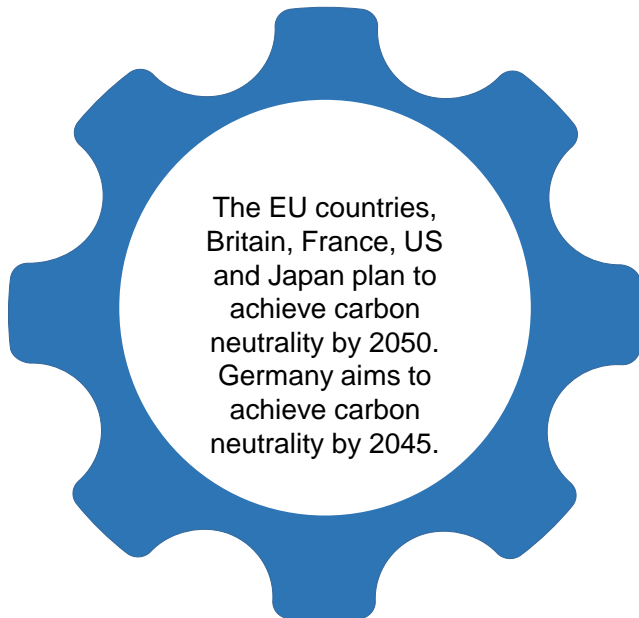
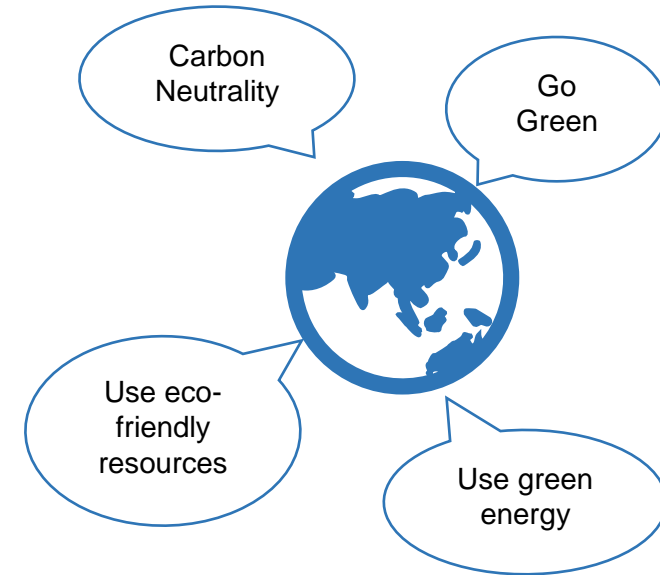
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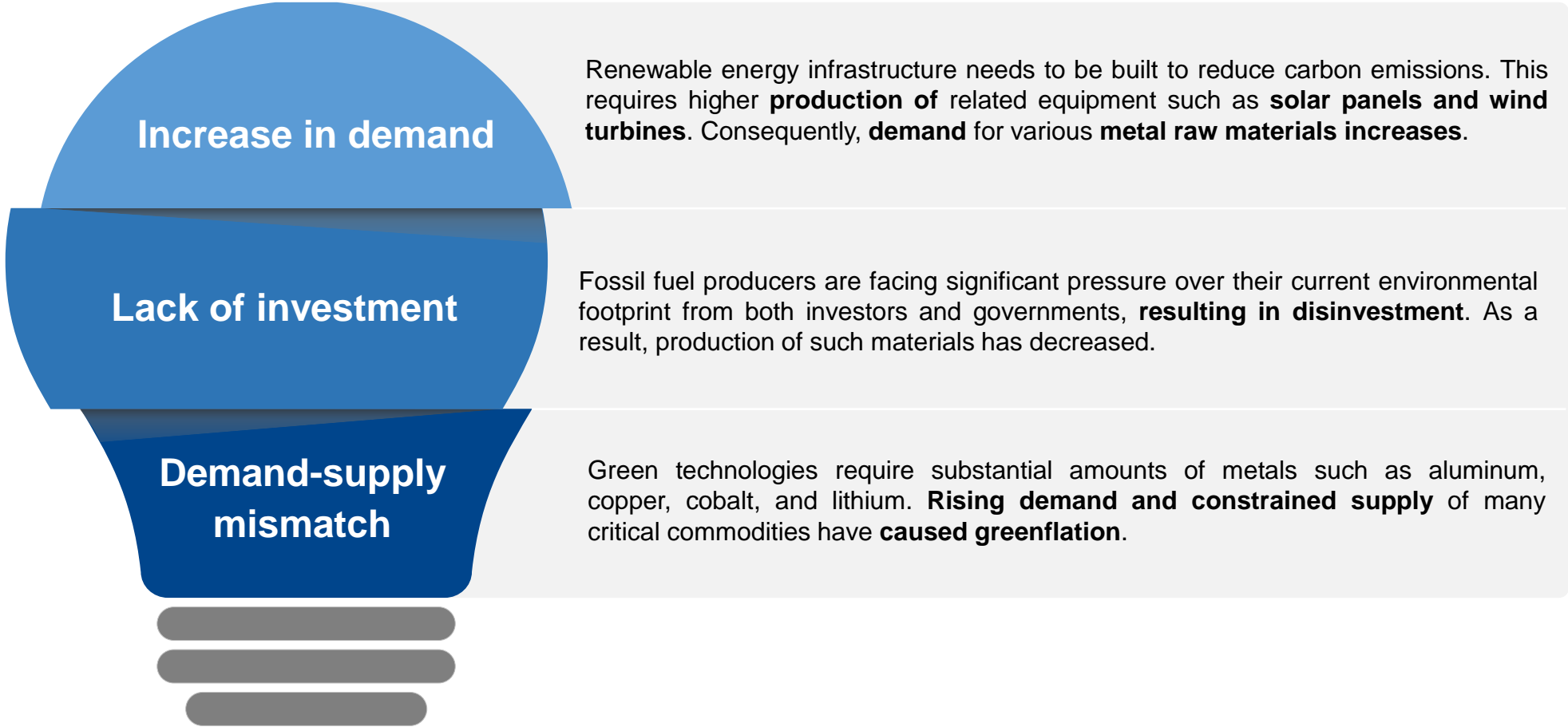
# Introduction to Greenflation

- The race to zero emissions is the new global trend to promote carbon neutrality, which means creating a balance between emitting and absorbing carbon from the atmosphere.
- To achieve this, the world is transitioning away from fossil fuels and embracing more sustainable power sources.
- Over the past few years, renewable energy has become one of the most widely used methods of electricity generation. It has led to a shift toward electric vehicles and low-carbon projects through innovation.



- As demand for eco-friendly raw materials such as electric vehicles and renewable energy power plants is concentrated, prices are soaring and eventually leading to inflation across the economy.
- A steep rise in the price of materials, minerals, etc. used in the creation of renewable technologies is termed Greenflation, which is inflation caused due to movement toward a green economy.

# Causes of Greenflation



# Causes of Greenflation

## Increased demand for commodities used to build RE sources and batteries

Al

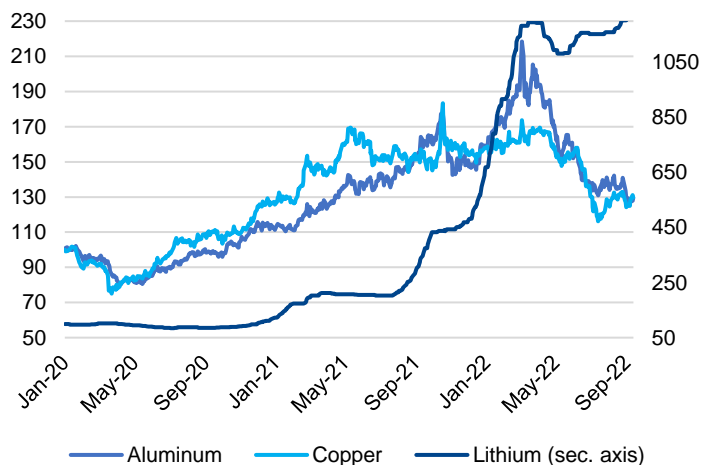
- Aluminum is **extensively used to build renewable energy platforms** like wind turbines and solar panels because it is lightweight, durable and has unmatched corrosion resistance.
- Coated aluminum roofs reflect 95% of natural light, making buildings energy efficient.
- The **metal maximizes solar energy during winters and minimizes it during summers** due to its natural properties. This ensures cost efficiency when it comes to heating or cooling the building.

Cu

- Copper is one of the few materials that can be recycled repeatedly without loss in performance.
- Copper is **used** in renewable energy systems **to generate power from hydro, solar, wind, and thermal energy** because of its highly efficient conduit.

Li

- Renewable energy storage has been ubiquitously utilized in the modernized world, through portable electronic, electrical vehicles, and grid-scale energy storage.
- For energy storage in the existing technologies, **lithium-ion batteries** have gained massive momentum due to their **potential to hold the greatest energy density**. Lithium batteries represent revolutionary technology in renewable energy storage, not only for **portable electronic devices** but **also for transportation**.



Source: Bloomberg, ET Energyworld; Note: Jan-20 = 100

### Reasons for decline in the price of metals after a steep rise:

- Prices of industrial commodities have been adversely hit due to **weak demand, slow global economic growth**, and a **two-decade-high US dollar**.
- Demand for aluminum in the market has slowed down** as makers of everything from automobiles to beverage cans to kitchen appliances hold booking raw materials for next year due to a steep change in price this year.
- China is the **largest importer of copper**. The country continues to struggle in the face of **repeated localized lockdowns** and **power rationing**. Both have shuttered the manufacturing industry, thereby affecting demand.

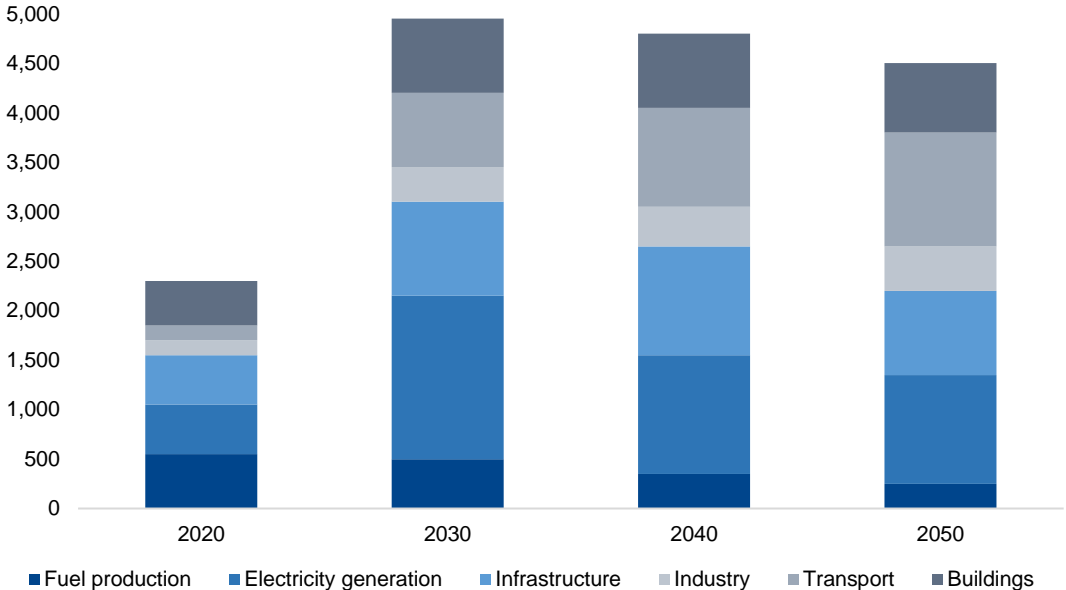
Although there has been a drop recently, prices are **still up compared to the past three years**. Also, if countries want to achieve carbon neutrality, **global demand for these critical metals may quadruple by 2040**, driving up prices further.

# Causes of Greenflation

## Lack of investment in traditional sources of power

- The energy industry has been underinvesting since 2014 but is expected to expand aggressively over the coming years. World energy investment fell 35% over the last decade, as green spending did not increase quickly enough to offset the decrease in fossil fuel investments.
- Annual capex needs to more than double by 2030 if net zero emission (NZE) expectations are to be met. Aside from fossil fuel production, massive investments in electricity generation and infrastructure are required.
- While there has been progress, the required investments in green energy are frightening and have not been ramping up fast enough until now.

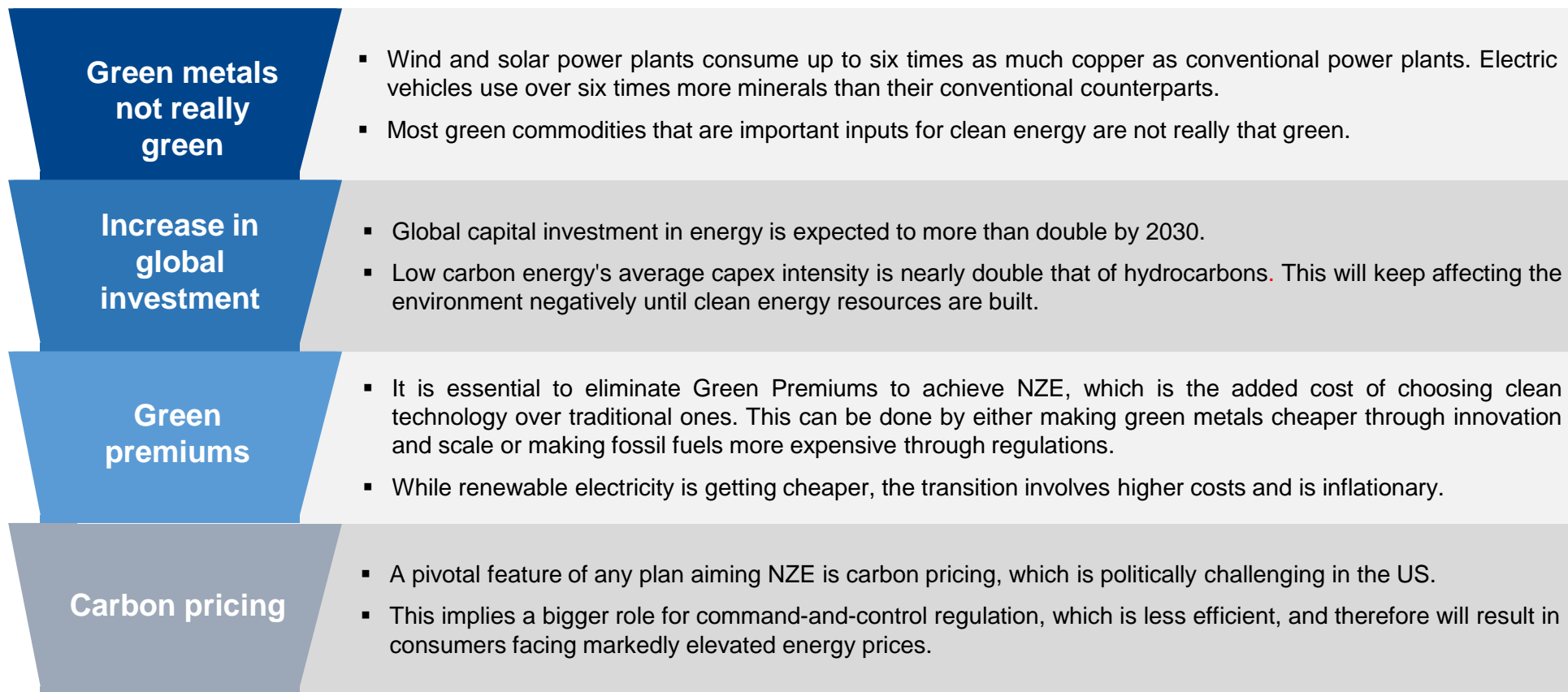
Estimated annual global capital investment required to reach NZE by 2050 (USD bn)



Sources: U.S. EIA, Bloomberg

# Consequences

## Transition to green energy will come at a higher cost



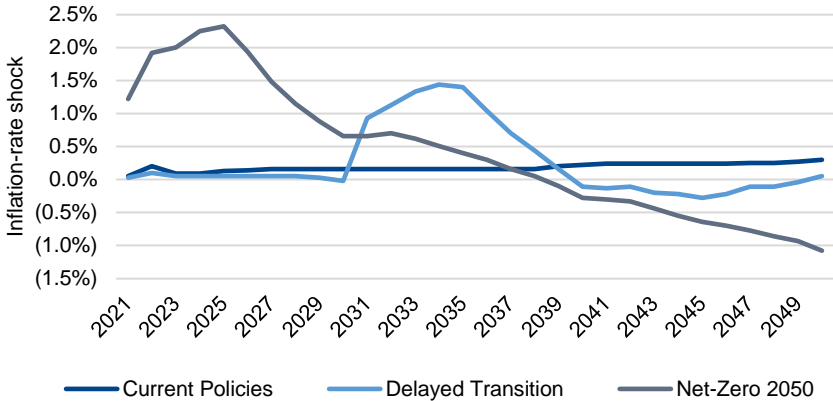
- Unlike past transitions where the world moved from biomass to fossil fuels, the **current changeover to green energy is unparalleled, urgent, and inflationary.**
- Only a transition that is not highly inflationary will lead to sustainable development.
- If countries, especially developing countries, **risk high inflation**, the social indicators of **inequality** and **poverty** will be on the rise.

# Effect of Greenflation on Bond Portfolios of Developed Nations

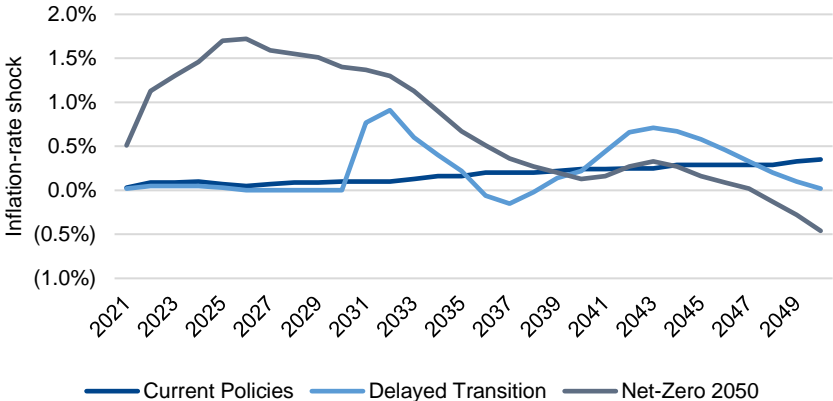
## Shift in investor expectations from a climate-agnostic baseline to a net-zero 2050 scenario...

- In addition to the inflationary pressures caused by the transition to a low-carbon economy, the increased investment demand required to finance the transition could push long-term bond yields higher and raise real interest rates. These developments could exert upward pressure on long-term interest rates, causing fixed-income portfolios to fall in value.
- According to MSCI research, US sovereign-bond portfolio's value may drop by about 4% if investors suddenly change their expectations from a climate-agnostic baseline to a "Net-Zero 2050" scenario.
- The Network for Greening the Financial System (NGFS) developed a set of climate-change scenarios that forecast inflation and interest rates over the next 30 years.

**Relation of Inflation to the Three Baseline Scenarios**



**Figure 1.1: United States**



**Figure 1.2: United Kingdom**

- The graph illustrates how much higher the US inflation rate is forecasted to be under various climate-change scenarios compared to a climate-agnostic baseline scenario.
- Referring to Figure 1.1, in the "Net-Zero 2050" scenario, US inflation rises initially before gradually declining. In the "Delayed Transition" scenario, inflation increases later than in the "Net-Zero" scenario.

Sources: MSCI (January 2022)



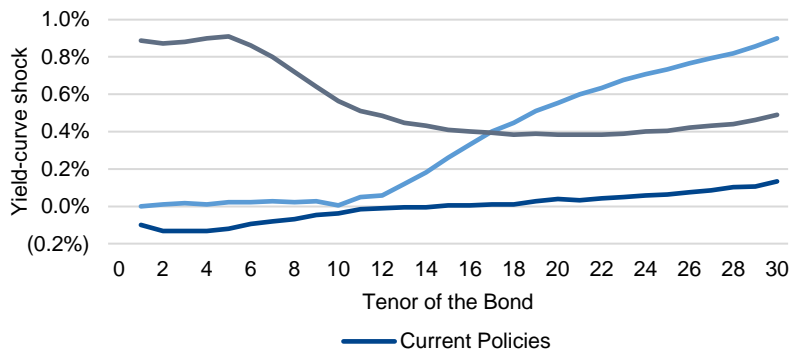
# Effect of Greenflation on Bond Portfolios of Developed Nations

...will lead to approximately 4% drop in portfolio value of US Sovereign Bond

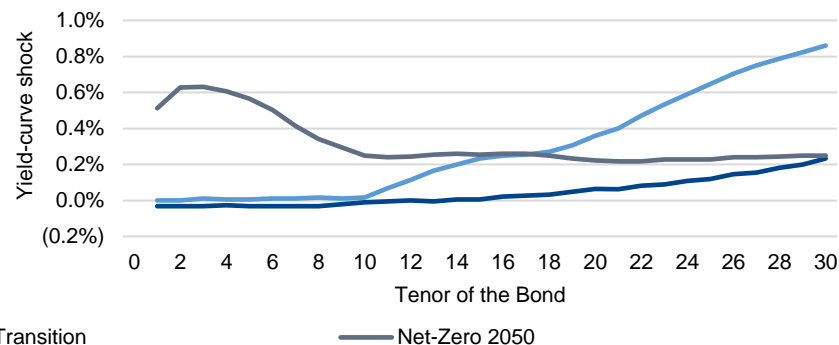
- The inflation assumption, along with other drivers such as increased investment demand, feeds the NGFS scenarios' short and long-term interest-rate projections. Based on these projections, how much sovereign-bond yields of different countries could move if investors' expectations shifted from a climate-agnostic baseline scenario to other climate-transition scenarios is evaluated.
- Countries experience a notable jump in the short end of the yield curve under the "Net-Zero 2050" scenario. In contrast, in the "Delayed-Transition" scenario, long-term yields may rise more, reflecting the later timing of the inflation spike.

Relation of Yield Curve to the Three Baseline Scenarios

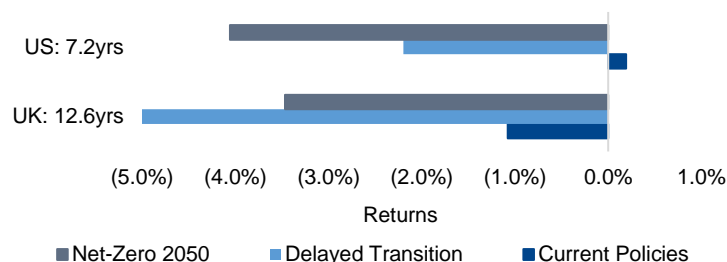
## United States



## United Kingdom



## Impact on sovereign-bond portfolios



- The average duration of the US sovereign-bond portfolio is approximately seven years. Hence, the "Net-Zero 2050" scenario results in the largest instantaneous repricing, resulting in a 4% loss for that portfolio.
- With an average duration of 13 years, the UK sovereign-bond portfolio contains longer-dated bonds, which are more substantially impacted under the "Delayed-Transition" scenario.
- As a result, the latter scenario resulted in the greatest losses.

Sources: MSCI (January 2022)

# Challenges faced in the short run to achieve green transition

## War will complicate the transition in the short term, but will have a minuscule effect in the long term

- As Russia is **one of the world's largest producers** of gas, oil, and commodities, one can naturally expect that the universal massive effort required to address the world's looming climate crisis would be caught up in the whirlwind.
- In 2019 and 2020, Russia largely exported natural gas to the European Union, **representing more than ~40% of EU imports**.
- Russia's invasion of Ukraine in 2022 and the subsequent **curtailment of gas flows to Europe**, as well as the **discovery of leaks in the Nord Stream 1 gas pipe** have further **limited gas supply to Europe**. All this has pushed international prices of natural gas to new highs. A record-high increase in the prices of natural gas in Europe is raising concerns that consumers will be hit hard by elevated energy bills as global demand for fuel rises.
- The crisis has led to a **decline in natural gas consumption across most regions**. In OECD Europe, gas demand declined close to 10% year-on-year during January to August.
- Situations like **power cuts** in many regions of Europe, including France, countries **phasing out coal power**, and poor year of wind production have led to many questioning the green transition.
- In the **short term**, war will **complicate** the transition. However, in the long run, the logic of economics and energy security may converge to accelerate the efforts to transition to a net-zero energy system.



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