

Energy Transition to Net Zero

The state of global energy markets and investments

#2 Negative trends

2021 was a year of great optimism. The implications of Covid-19 were receding, with signs of a strong rebound in economic activity. At the same time geopolitical tensions had cooled, with a return to political orthodoxy in the Biden administration. COP 26 also delivered commitments to phase down coal, as well as raise the salience of climate within the investor community.

Where were we in 2021?

Optimism post-Covid, with positive economic and political conditions. The energy transition looked on a stable path, maintaining high salience and commitment despite the shock of the pandemic.



Global Cooperation

China and the US agreed to boost climate cooperation

Countries agreed to strengthen emissions targets to 2030



The End of Coal?

COP agreed action on “phasing down” of coal – rather than “phasing out”

Failed to commit to phase out “fossil fuel subsidies”



Economic Bounce Back

The economic restrictions imposed by the pandemic were being alleviated

Strong economic rebound by surplus savings and major fiscal and monetary stimulus



High Climate Salience

Public consciousness of climate-related issues continued to rise, amidst political and activist campaigns as well as COP 26

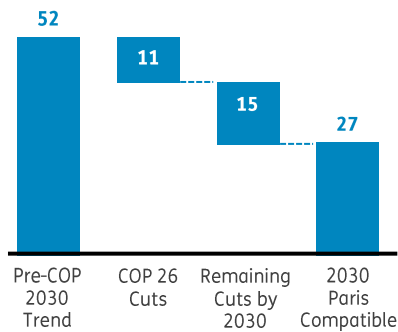


Investor Pressure

ESG and wider stakeholder capitalism agenda drove increasing investor activism with capital deployment to green technologies

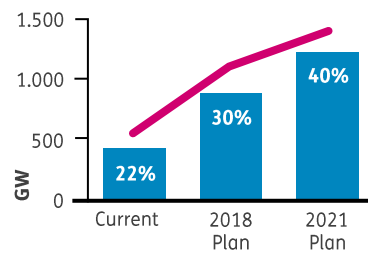
Where were we in 2021? (continued)

COP 26 Success (Gt CO2)



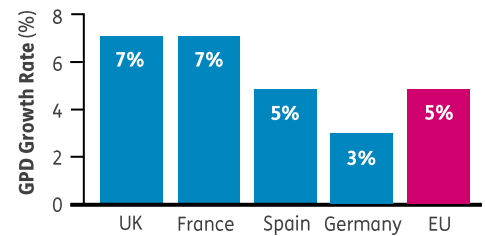
Source: Climate Action Tracker

EU Upgrades Renewable 2030 Targets



Source: EU Commission

Strong Economic Rebound 2021



Source: World Bank

High Point of Target Setting

2021 saw a new high-water mark in terms of target setting.



- ▲ Net Zero by 2060 (verbal commitment)
- ▲ Peaking GHG emissions “before 2030”
- ▲ Reduce emissions intensity of GDP by “over 65%” by 2030 compared to 2005



- ▲ Net Zero by 2050 (executive order)
- ▲ 50-52% GHG reduction by 2030 compared to 2005
- ▲ Zero carbon power generation by 2035



- ▲ Net Zero by 2050 (regulatory directive)
- ▲ Reduce GHG emissions by at least 55% by 2030, compared to 1990



- ▲ Net Zero by 2070 (verbal commitment)
- ▲ Reduce emissions intensity of GDP by 33-35% by 2030 compared to 2005

Corporate Net Zero Commitments



The Russian invasion of Ukraine has generated four impacts, each with the potential to alter the course of the energy transition.



Gas and Power Price Shock

Shortage of Russian pipeline gas has sent fossil fuel prices spiking, with European benchmarks in particular seeing unprecedented highs.



Stagflation

Rising commodity prices have stoked a bitter cocktail of accelerating inflation and decelerating growth. As a consequence, the growth outlook globally has been slashed.



Energy Security

Governments have placed renewed importance on the imperative of energy security as faith in global supply chains has been rocked on account of Putin's weaponisation of gas supplies.



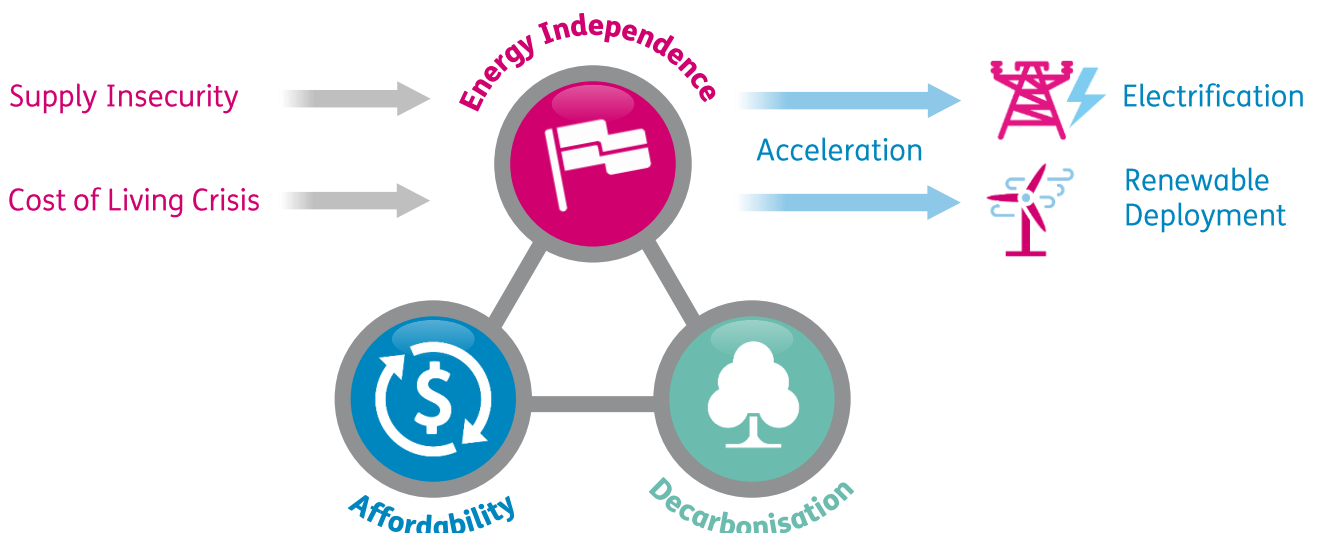
Political Tension

The invasion of Ukraine has signalled an abrupt end to the stability of the post-Cold War era. New geopolitical blocs create instability abroad, whilst an emerging cost of living crisis threatens to enflame discord at home.

Shifting Priorities: The Energy Trilemma

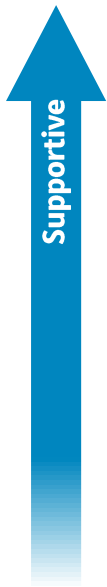
Increasing supply insecurity and price volatility have driven a renewed emphasis on energy independence.

The weaponisation of Russian gas flows has created a paradigm shift in thinking regarding the energy trilemma in Europe. The role of supply security and energy independence has been re-prioritised. In Europe, where there is a lack of domestically available fossil fuels, this is expected to lead to an accelerated transition to reduce foreign dependencies.



The Implications for Energy Investors into the Energy Transition

Reasons to be positive, and to be cautious.



- 1 Accelerated Electrification in Europe**
 Energy security concerns will drive an accelerated transition in Europe. Decarbonisation through electrification is the preferred route to ensure energy security, not least because it aligns with climate goals. This will necessitate the mass rollout of electric heat pumps and EVs, requiring accelerated renewable energy deployment.
- 2 Positive Renewable Economics with High Commodity Price**
 Elevated commodity prices are expected to create a prolonged period of high power prices. This will both increase the attractiveness of renewables relative to fossil fuels and also increase profitability for power generators and developers.
- 3 Accelerated Renewable Rollout**
 An accelerated renewable deployment is expected to be pursued to reduce the role of gas in the energy mix and secure energy independence. This will put pressure on existing renewable pipelines.
- 4 Acceleration of Alternative Gases**
 The acceleration of renewable deployment will increase the challenges posed by renewable intermittency. Alternative sources of power flexibility including biofuels, synthetic fuels and hydrogen and its derivative products will become more prominent as natural gas is removed from the mix.



- 1 Longer-Term Economics Risk**
 The uncertain trajectory of future commodity prices creates downside risk for power generators if commodity markets move from famine to feast. Equally, a cost of living crisis is incentivising political action to cap the upside of energy profits or attempt to decouple renewable prices from commodities.
- 2 Rising Cost of Capital**
 Rising inflation is causing interest rates to rise, ending a period of unprecedentedly low interest rates since 2008. This will increase the costs of raising finance for developers.
- 3 Permitting and Grid Constraints**
 There will be persistent challenges in converting accelerated renewable demands into greater supply owing to planning, permitting and grid capacity issues.
- 4 Supply Chain and Production Costs**
 Increasing demand, coupled with rising material costs, is creating price pressure on the renewable supply chain. The rise of local sourcing requirements risks compounding these price pressures further.
- 5 Government Spending**
 Economic pressures and politicisation of the decarbonisation agenda risk reductions in fiscal support for green technologies.



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Longer-Term Economic Risks

Higher prospects for government intervention and market reform create downside risks.

Whilst high commodity prices are expected to provide profit opportunities for renewables, there are downside risks which could undermine the profitability of investments.

Economic Risks



Short-Term Risk

High power prices are regressive and politically challenging for democratic governments. With fiscal conditions tight, after pandemic-related spending, appetite to subsidise fuel bills is limited. Prolonged high power prices may incentivise government action to cap the upside of suppliers. This could include:

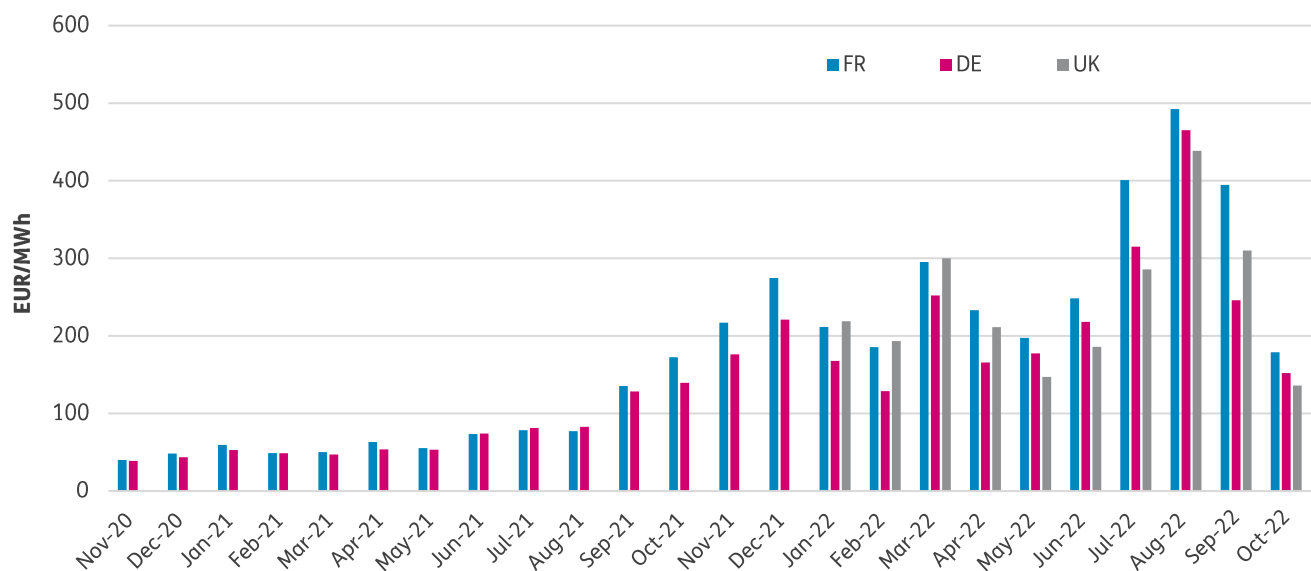
- ▲ **Windfall Taxes:** High profits may lead to call for windfall taxes. These have already taken place in key European markets.
- ▲ **Market Reform:** Decoupling gas prices and power prices through direct purchases of renewable power at fixed prices would reduce the role of marginal pricing and cap any upside for generators as a result of high commodity prices.



Long-Term Risk

Renewable oversupply: Accelerated renewable deployment could result in price cannibalisation of energy prices for future renewable assets earlier than expected. This would result in lower merchant returns in later decades than previously modelled. This effect may be amplified if coupled with a lack of protection from market structures.

Wholesale Power Prices



Source: Cornwall Insights – as of August 2022



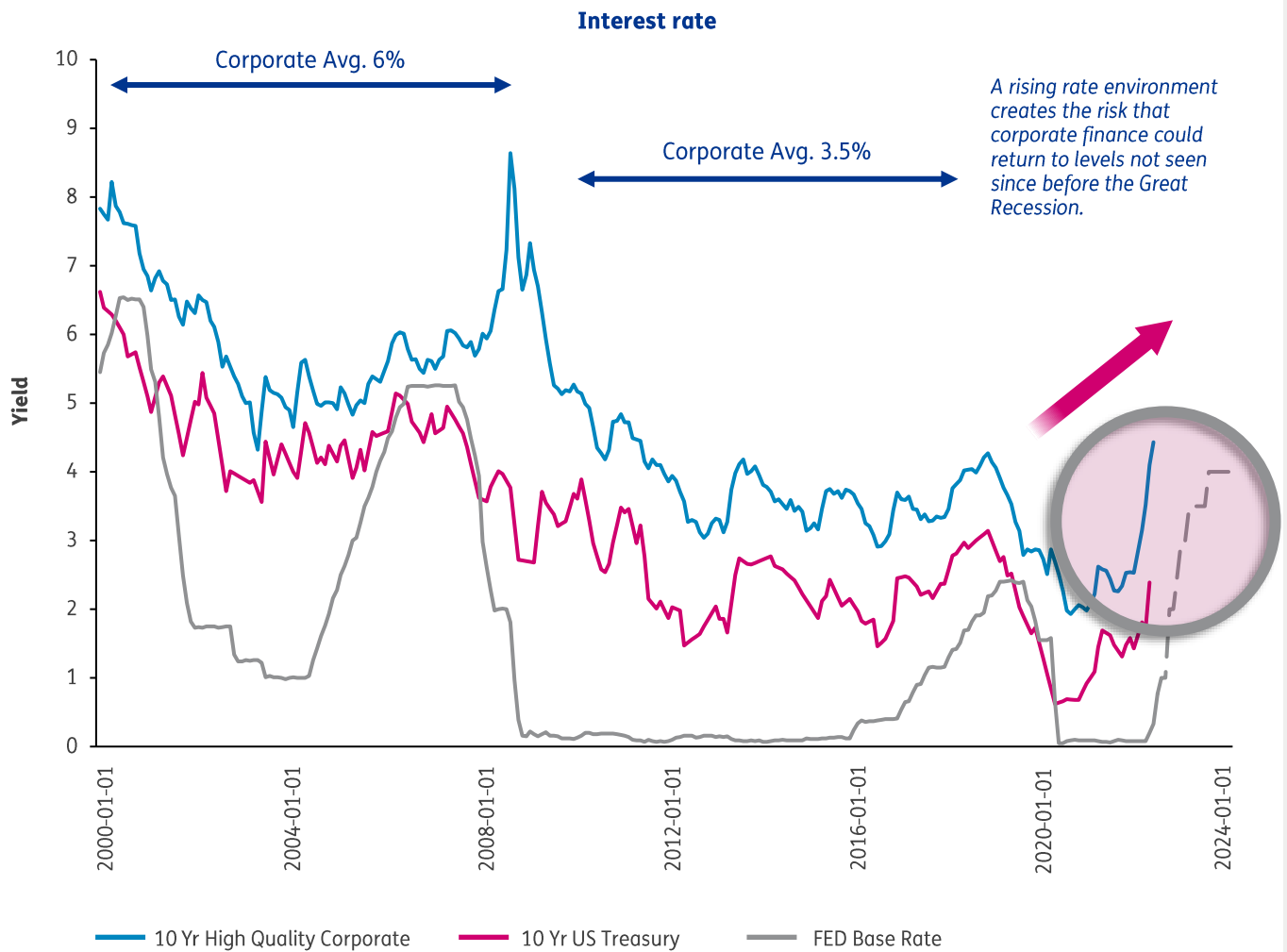
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Rising Cost of Capital

Rising inflation expectations are driving an acceleration in government and corporate yields.

An accelerating inflation environment is ending the post-2008 period of ultra-loose monetary policy. As a consequence, rates are rising rapidly. Base rates across the Atlantic are accelerating and could peak at c.4-6%. This will raise the project financing costs of renewable investments as rates return to pre-08 trends.

Higher inflation outlook signals rising cost of capital



Source: FED Data Bank

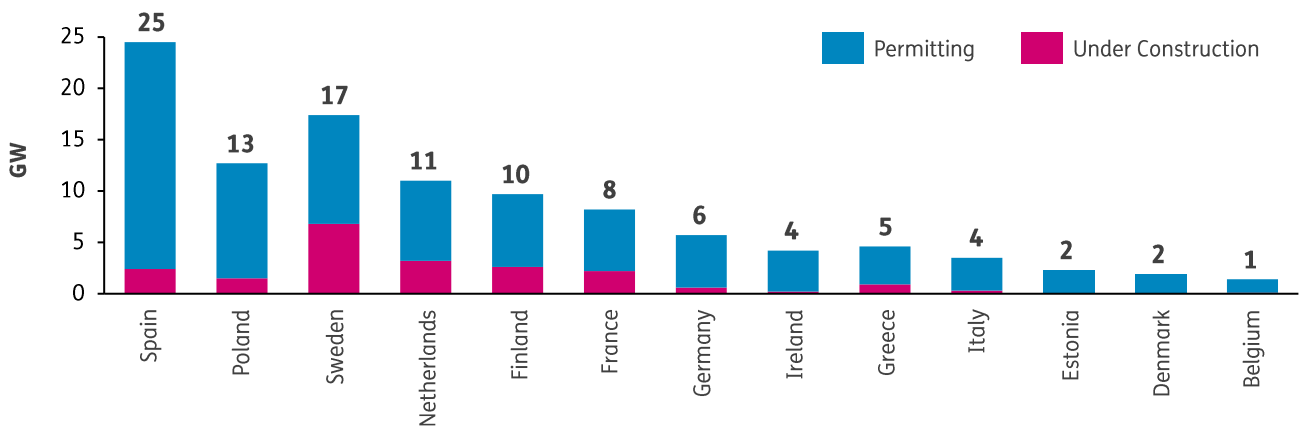


3 Permitting and Grid Constraints

Accelerated development faces challenges from slow permitting and grid constraints.

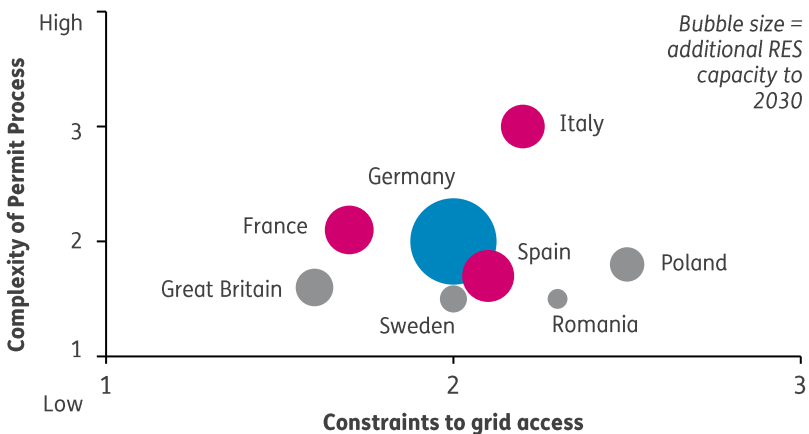
Continued frictions in terms of permitting time frames and grid connection constraints may limit the speed of delivering operational projects.

Permitting Pipeline: Major EU Countries Permitting Pipeline



- ▲ Current permitting times create bottlenecks and stall deployment, potentially jeopardising installation targets. The average permitting time in Greece for wind projects is 8 years.
- ▲ The permitting-to-construction ratio for wind development is particularly poor when compared to other major markets such as the US and China.
- ▲ New EU rules will require member states to identify “go-to areas” which will have a maximum permitting time of a year to speed up construction, limiting the rights for objections and opposition.
- ▲ These sites would be identified at the discretion of member states.

Grid Constraints: Grid and Permitting Complexity vs RES Additional Capacity by 2030*



- ▲ Significant capacity additions are facing potential hurdles.
- ▲ A number of countries, in particular Germany and Italy, are actively looking to introduce measures to streamline processes.
- ▲ Constraints likely to remain when local / regional authorities are involved and local community is not supportive of renewables.

* Leading European countries ranked by constraints to grid access, complexity of permitting process and projected additional RES capacity by 2030

* Data based on qualitative expert reviews: Ratings: 1 – Low complexity / constraints; 2 – Some complexity / constraints; 3 – High complexity / constraints

Source: Energy Monitor & Baringa Country Experts

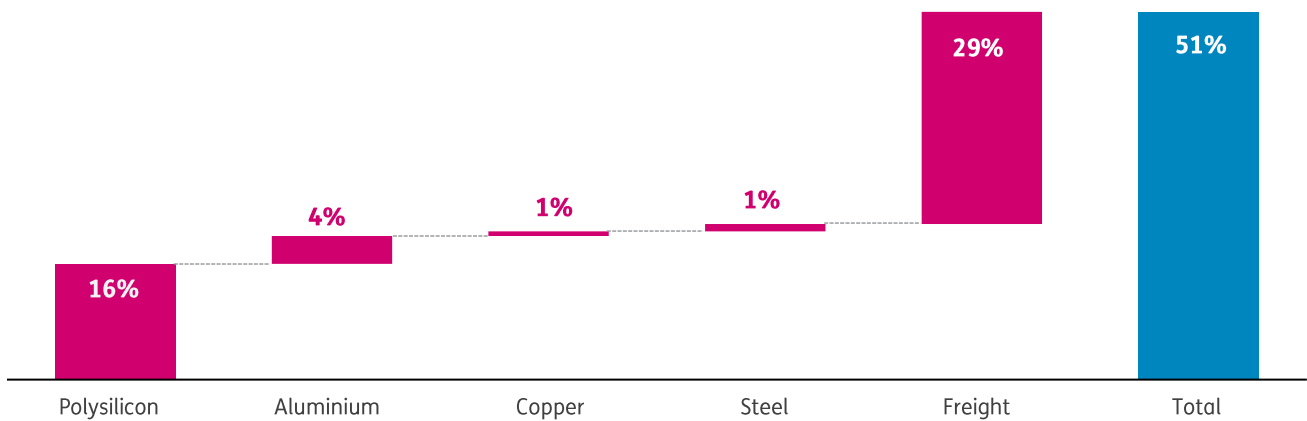


Supply Chain and Production Costs

Globalisation faces uncertainty as geopolitical tensions and rising protectionist impulses contribute to trade stagnation.

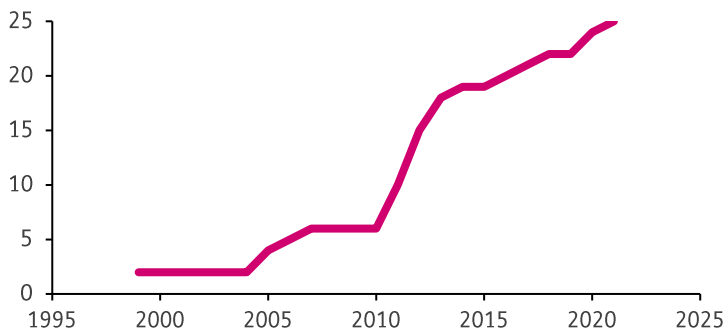
Protectionist pressures in the form of re-shoring and trade frictions risk supply chain inflation for renewable projects.

Production Costs: Solar PV Material Price Change Breakdown (Jan 20 – Jan 22)



- ▲ Production costs for renewables have been rising rapidly. Estimates for solar PV show a 50% increase in investment costs since 2020, driven primarily by rising polysilicon prices and freight costs.
- ▲ These elements are due to cyclical drivers such as Chinese Covid lockdowns and so, whilst the effects may be elongated, supply and demand are expected to balance in the medium term.

Supply Chain and Protectionism: Countries with local content requirements for solar and wind development



- ▲ Economic conditions have incentivised political demands for job growth, especially in high-skilled, high-paid technical work. Abroad, political tensions have driven mistrust and competition over strategy sectors such as 5G, semiconductors, rare earth metals and renewable technologies.
- ▲ The consequence has been a steady rise in protectionist impulses, with both explicit trade tariffs and local content requirements rising.

Maximum Tariffs Leveraged	Wind Power Related	Solar Power Related
EU	19%	17%
US	25%	15%
India	5%	40%

Source: IEA

**5**

Government Spending

A decrease in fiscal support may affect the growth and adoption of less mature technologies.

Fiscal conditions across Europe have deteriorated markedly on account of the ramifications of Covid-19 and the Russian invasion of Ukraine. As a consequence, there exist risks for investors dependent on government spending either through complimentary investment or subsidies to ensure take-up generates sufficient demand.

Lack of investment

Economic pressures and politicisation of the decarbonisation agenda risk underinvestment in green technologies. Mature industries such as solar and wind can grow without public investment. However, less mature technologies rely more on fiscal support. Underinvestment in these technologies will slow their growth, thus undermining the demand for renewable assets, along with their commercial value.



1. Grid Development and Connection

There is already a backlog of renewable projects waiting for connection onto the grid. A lack of investment into grid development and connections could increase lead times for renewable projects.



2. Consumer Uptake

The mass rollout of EVs and electric heat pumps will require accelerated renewable energy deployment. Consumer subsidies make these products more attractive, and a lack of investment may slow their deployment.



3. New Technologies

Further technologies required for green hydrogen, long-duration battery storage and electrification of heavy industry will require government funding for R&D and initial deployment. Slow development of these technologies will decrease the pace of electrification.

Government austerity

The current economic climate may mean that governments try to raise extra funds through energy asset auctions or lower energy costs to consumers through long-term contracts.



4. Revenue Maximisation

Where government budgets are tight, central government may be incentivised to raise additional revenue in the energy system. This could act to raise costs, slow deployment and reduce long-term profitability. For example, governments selling seabed assets are incentivised to maximise short-term revenue potential at the cost of longer-term consumer prices.

So What?

The implications for energy investors into the energy transition.



Will the macro environment remain favourable?

Investors in the energy transition are set to benefit from positive tailwinds set to impact the renewable energy ecosystem. Accelerated electrification, owing to the renewed emphasis on energy security and the elevated commodity price environment, will contribute to a favourable outlook for investors.



Are you well placed geographically to take advantage of these trends?

Geographical exposure to Europe (and US) provides an advantageous position to capture the trends towards accelerated renewable development. Investors must ensure they are optimally allocating resources across these markets to maximise the overall opportunity.



Solution design is becoming even more important.

The energy transition is creating a myriad of needs from governments and end users and simple offerings are becoming less compelling. Investors need to diversify their technology set, develop customer-oriented commercial propositions and services which are more compelling than before.



Innovation is required to overcome ongoing (and potentially strengthening) obstacles.

Challenges to accelerating renewable deployment to meet new targets are likely to continue to create frictions, particularly planning reform and grid connection. Innovation in business models and investment strategy will be required.



Competitive risks are becoming more acute.

The current climate is galvanising new entrants and raising financing costs. Investors need to combat these risks by growing bigger and broader, to stay at the front of the pack rather than being left behind.

If you are interested in hearing more, please get in touch with our experts.



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