

Global markets and the energy transition

Challenges and mitigations

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Securing the transition in a more volatile future

Now more than ever we need to invest in clean technologies, as the trilemma is in sharp relief – affordability, security, environment.

But the world has become much more uncertain with increasing risks: volatile prices; calls for regulatory reform; increasing cost of capital; cost inflation; uncertain supply chains; a battle for investment and talent...

How can UK plc secure its energy transition?





Scarcity of gas in Europe was driving the agenda

ROUTES OF RUSSIAN GAS INTO EUROPE



Sources: IEA WDS, ENTSOG, S&P

DAILY RUSSIAN GAS FLOWS 1 JAN - 19 FEB 2022 (BCM/DAY)



For now European storage levels are high







In 2022 Europe had some headwinds on LNG imports

LNG IMPORTS BY REGION (BCM/A)



MAIN DRIVERS BEHIND EUROPE'S ABILITY TO ATTRACT ADDITIONAL LNG CARGOES

1. Decline in Chinese demand

China's zero covid policy resulted in weak economic activity over the course of 2022

2. Price-sensitive markets in Asia (India, Pakistan, Bangladesh)

Affordability issue meant that LNG cargoes were attracted to the premium European market, resulting in shortages and blackouts in Asia

3. Strong hydro performance in South America

Led to about 8bcm less LNG imported, which was drawn to the European market



Notes: Europe includes GB + Turkey Sources: LNGEdge

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Still gas prices became increasingly volatile



Notes: Secondary axis (in €/MWh) assumes exchange rate of €1=\$1.05



GB Example

Causing unprecedented levels of wholesale electricity prices



Historic day ahead prices (monthly average), various sources for Great Britain



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Leading to calls for windfall taxes and market reforms



Source: BEIS, Review of Electricity Market Arrangements, 2022



With inflation leading to increasing equipment costs



RES COST CHANGE BY COMMODITY AND FREIGHT INPUT

- Last year, the IEA performed an analysis of the impacts of commodity price increases into RES technologies:
 - For solar PV, the main drivers of the increase are steel, aluminum and polysilicon.
 - For onshore wind, freight and steel are the most relevant factors.



RES CAPEX EVOLUTION, INDEXED TO 2015=100

- The IEA estimates that the investment cost for solar PV and onshore wind will be 15 to 25% higher in 2022 versus 2020.
- The projection considers that costs will go back to decreasing by 2023 but that seems rather optimistic today.



Source: IEA, May-2022

Against a backdrop of increasing metals and minerals prices

HIGHLIGHTS

- The disruptions in global supply chains, increase in commodity prices and freight costs seen in 2021 lead to increased costs for energy projects.
- For solar and wind projects, the IEA estimated an increase of 4% for capex in 2021 versus the previous year, reverting the long-term downwards trend seen for both technologies.
- The invasion of Ukraine deepened the pressure over commodities, further increasing costs.
 - Siemens Gamesa CEO expects wind turbine pricing to return to 2017 levels.
 - The IEA projects increased costs of 15 to 25% for solar PV and onshore wind in 2022 versus 2020.
 - IRENA projects an increase of 10 to 30% in the costs of batteries commissioned next year. IRENA projects an increase of 10 to 30% in the costs of batteries commissioned next year.

PRICE INCREASE FOR MINERALS AND METALS*





Example of Western Europe

GLOBAL MARKETS AND THE ENERGY TRANSITION And increasing cost of capital



Source: AFRY, A cross-country comparison of financial returns on investment in utility scale wind and solar PV projects



GLOBAL MARKETS AND THE ENERGY TRANSITION Long term our global demand modelling suggests gas demand will stay firm

GLOBAL COAL DEMAND (MTOE)

Coal demand decreases primarily in China, North America, India & Southern Asia and Africa





Source: AFRY's Global Energy Demand Model (GEDM), modelling by Beijing office of Chinese coal and gas demand in light of latest targets



With global demand met in part by increases in US LNG liquefaction capacity





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But still the AFRY Central lies in the 2-2.4°C warming scenario range

TOTAL ANTHROPOGENIC GHG EMISSIONS



Climate Action Tracker 2022: temperature scenarios range

Temperature in °C		Lower bound	Median	Upper bound
Current policies & actions	High	+2.4	+2.9	+3.5
	Low	+2.1	+2.6	+3.1
2030 Targets only		+1.9	+2.4	+2.9
Pledges and Targets	High	+1.6	+2.0	+2.5
	Low	+1.4	+1.8	+2.2
Optimistic scenario (net-zero pledges)		+1.5	+1.8	+2.3
1.5°C consistent			+ 1.3	

Source : AFRY, Climate Action Tracker, November 2022

Optimistic scenario (net-zero pledges)

AFRY projections

- Carbon emissions from fossil fuel use- AFRY Central GEDM
- Other GHG (not in GEDM)



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How can UK plc secure its energy transition?





Securing the transition in a more volatile future



- Stable government
- Stable policy
- Stable regulation

- Energy strategy
- Industrial strategy
- Infrastructure strategy
- Environmental strategy

- General public
- Consumers
- Landlords
- Landowners
- Investors



GLOBAL MARKETS AND THE ENERGY TRANSITION Or one could seek the wisdom of AI...

ChatGPT "what is the likelihood of the UK making an energy transition?"

"The likelihood of the UK making an energy transition is high, as the UK has set ambitious goals to transition to a low-carbon energy system. The UK government has committed to reducing greenhouse gas emissions by at least 68% by 2030, and achieving net-zero emissions by 2050.

To achieve these goals, the UK government has implemented policies and initiatives to support the transition to a low-carbon energy system. For example, the government has set targets for renewable energy generation and has introduced financial incentives for renewable energy investments. The government has also implemented measures to increase energy efficiency in buildings and transport, such as the ban on the sale of new petrol and diesel cars from 2030.

Furthermore, the UK has made significant progress in transitioning to a lowcarbon energy system over the past decade. Renewable energy generation has increased significantly, and coal-fired power plants have been phased out. The UK is also investing in new technologies such as offshore wind, hydrogen, and carbon capture and storage to support the transition.

While there are still challenges and barriers to overcome, such as the need for significant investment and infrastructure upgrades, the UK's commitment to the energy transition and the progress made so far suggest that the likelihood of a successful energy transition is high."

Dall-E "UK plc making an energy transition"





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