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Introduction: rebalancing the energy trilemma

In this latest edition of our Key Themes series we examine a number of topics which we believe will be highly relevant to the global energy economy in 2023. The past twelve months have seen a huge re-prioritisation of energy policy away from environmental issues and towards energy security and affordability. Many of the articles in this document question whether this will be a long-term trend or whether sustainability will return to the top of the policymaking agenda once the short-term need to focus on security of supply has passed. Indeed, many of our contributors argue that the short-term rebalancing of the energy trilemma towards energy security may even bring environmental benefits in the longer term given the desire of many countries to reduce their exposure to hydrocarbons in the aftermath of the war in Ukraine and its energy-related consequences.

The re-balancing of the energy trilemma

The energy trilemma has been a major plank of energy policy thinking over the past decade, focusing on the balance between achieving *sustainability* (decarbonisation of the energy system), *equity* (accessibility and affordability for consumers), and *energy security* (ensuring adequate supply). In developed economies, growing concern about the environmental impact of the energy economy meant that sustainability had increasingly become the priority, especially since the Paris Agreement at COP21 in 2015, with affordability and accessibility being related concerns of the energy transition, while energy security was seen as a lesser issue thanks to the availability of diversified supplies delivered through increasingly fungible global markets. In contrast, in many parts of the developing world, energy equity and security arguably ranked above sustainability, although the growing frequency and impact of extreme weather events has clearly placed the low carbon transition higher on policy agendas.

Russia's invasion of Ukraine has not only caused a dramatic reconsideration of this prioritisation, with energy security becoming the number one focus globally, but it has also highlighted the difference in perceptions of the trilemma around the world. In addition, a fourth dynamic – government intervention – is further highlighting the differences in perception and the difference in ability to manage the energy trilemma. The provision of finance is also a major topic of debate, especially in the Global South where countries are demanding support from the developed countries which are seen as responsible for the current environmental issues. 2023 will see further debate about the rebalancing of the energy trilemma from a global perspective, with a number of key themes set to dominate policymaking, corporate decision-making, and academic debate.

Differing regional perspectives

In Europe, and especially the EU, the drive to diversify away from imports of Russian energy will continue. However, while the need to secure adequate supply for the winter of 2023/24 will necessitate a focus on short-term access to alternative sources of natural gas, 2023 could also be a year in which EU plans for a faster energy transition start to crystallise. The REPowerEU plan that was catalysed by the Russian invasion of Ukraine is based on the thinking that a more rapid decarbonisation of the

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European energy system can provide more energy security over the long-term as well as helping to achieve the continent's climate ambitions. However, two key questions that will be intertwined in 2023 are firstly whether energy security issues will continue to dominate and distract politicians away from the longer-term sustainability goals, and secondly whether the longer-term goals themselves, especially the aim to reduce gas demand set out in the REPowerEU plan, could undermine efforts to secure new supplies in the short term.

The theme of short-term energy necessity merging into longer term climate strategy is also seen in other regions which are struggling to balance the energy trilemma. In many Asian countries, for example, high energy prices and the reduced availability of LNG taken by Europe have forced a reconsideration of energy strategy. Development of domestic coal resources, although clearly less environmentally friendly than many alternative energy sources, is becoming a priority again as cost and availability trump climate impact, at least in the short term. Meanwhile in Africa, the EU's search for new gas supply has rekindled the drive to develop new gas export projects that can also supply the domestic market. In this case, a dual desire to generate export revenues and to provide energy access means that the priorities of the trilemma are being rebalanced.

Assessing technology and financing options

As the role of hydrocarbons is being reconsidered, and as the reality that they may remain important to the global energy system for longer than many would like becomes clear, so the sustainability element of the trilemma is being adjusted to cope. As evidenced at COP27 the development of carbon removal technologies, voluntary carbon markets, and carbon capture and storage business models is set to become an increasing theme in 2023 and beyond, at least with a medium-term perspective of facilitating a more orderly transition to a carbon-free energy system in the longer term.

This does not mean that the expansion of renewables as soon as possible is not critical – it clearly is and 2023 will provide more evidence of how growth is accelerating. However, another dynamic that will be a continuing focus in the coming year is the financing of the transition to a zero-carbon economy in the Global South. While rich OECD countries have the wealth to deal with a short-term energy crisis while also planning for a longer-term clean energy future, COP27 underlined that the developing world, where most of the growth in economic activity, population, and emissions will be seen over the next three decades, do not enjoy similar wealth and are demanding assistance from the Global North, which is the cause of the environmental problems in the first place. This finance dynamic that surrounds the energy trilemma in many regions of the world will be a huge focus in 2023, as the debate over the provision of funds for mitigation, adaptation and loss and damage develops ahead of COP28 at the end of the year.

Geopolitics will be critical

Beyond this issue, the rebalancing of the energy trilemma to focus on energy security has also highlighted some of the key emerging risks in the energy transition. With relations between the world's two largest emitters, China and the US, becoming ever more competitive and assertive, a race to be the technology leader of the energy transition is well underway, and has been ratcheted up by the recent US strategy to dramatically limit technology transfer to China. While this will undoubtedly have a negative impact on China's ability to develop certain technologies it also highlights the cards which China has to play regarding security of supply of critical minerals and materials. Its dominance of the mining, and especially the processing, of key inputs to energy transition technologies is becoming a major element of the energy trilemma and of geopolitical debate, which is a further destabilising factor in resolving the rebalancing question.

Two final points can be made on the impact of this rebalancing process and the uncertainties surrounding it. The first is that it increases the risk of stranded assets – a short-term focus on hydrocarbons to replace Russian imports could lead to the development of new resources that have a limited lifespan should the elements of the trilemma be rebalanced again in the near future. This leads to a second key commercial risk for companies who are the key investors in the energy system. How do they balance short-term needs for energy security with longer term demands for a low or zero carbon environment? And how do they factor ESG requirements into their investment planning? One answer is that they will aim to develop any energy resources, hydrocarbons included, with as low a carbon intensity as possible, but 2023 is likely to be another year where this assertion is severely tested by the

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competing interests of energy consumers, environmental NGOs, demanding shareholders, and policymakers with multiple short- and long-term objectives.

As a result, in 2023, the energy trilemma will remain critical for a number of reasons and will provoke a wide range of vital questions. First, as European countries seek new LNG supplies, will these undermine policies aimed at advancing the energy transition? Related to that, will ambitious targets to reduce emissions through lower gas consumption limit Europe's ability to secure long-term gas supplies? Next, how will European policies and commercial strategies impact the availability and affordability of energy in developing economies? Given sustainability concerns, can new hydrocarbon projects—required for supply security—get off the ground? And how will government policies impact these choices? Already, governments (and EU institutions) have been instrumental in dictating storage trends (both oil stock releases and gas stockpiling), which have in turn impacted price signals. Government perceptions of market risks and global trends will therefore be critical in 2023 as they inform policy choices and balance the trilemma. Finally, and related to this, government choices will lead to financing priorities: will governments opt to subsidise end users to shield them from the impact of high energy prices, or will they proceed with taxing fossil fuels and imposing carbon tariffs? Will developed economies invest in new hydrocarbon projects, grids, batteries or critical materials at home or abroad and how will these investment choices be perceived in developing countries?

To help in assessing these questions and to provide some initial responses we have grouped the articles in this Key Themes paper as follows. We start within an assessment of, and outlook for, the global oil market, before continuing with a series of articles on Europe, including the outlook for gas demand, the need for significant regulatory activity in the EU, the importance of monitoring gas storage levels, and the potential impact of prices caps. We also look at whether EU member states will respond to solidarity agreements in a crisis situation. Moving to a more global perspective we then review the availability of LNG to meet European demand and what this might mean for other importing regions before assessing the impact of the re-opening of the Chinese economy, the energy implications of India taking over the G20 presidency, and the development of Africa's hydrocarbon strategy as part of the energy transition.

This takes us onto questions of a more environmental nature. We look at the issues that will likely be raised in the Global Stocktake which will take place in 2023 ahead of COP28 and also consider the critical financing issues that emerged from COP27 and need to be addressed during this year. We then review the need for further progress on Article 6 and the development of voluntary carbon markets, and related to this we consider the outlook for carbon removal technologies and the potential for further progress on the issue of accounting for greenhouse gas emissions in the energy value chain. We return to look at China, which has also pledged to issue a methane action plan this year but where a rapid rebound in energy demand could delay climate action and lead policy makers to focus on avoiding power shortages. Moving to the electricity sector, another contribution outlines why 2023 will be an important year for electricity market design in Europe. We also consider the resurgence of nuclear power across the world and ask whether 2023 will see a further acceleration of this trend. Finally, we discuss the impact of the US's Inflation Reduction Act on the development of hydrogen technology and ask whether it undermines activity elsewhere in the world.

This list of themes is long but it is clearly not exhaustive. However, it highlights many of the topics which we will be researching at OIES during 2023 and we would encourage you to access our written output at www.oxfordenergy.org. For further details about how to join the discussion at the many events which we hold for our sponsors and benefactors, where you can meet our fellows and address issues in more detail, please contact Kate Teasdale at kate.teasdale@oxfordenergy.org.

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