Written Testimony
Hearing of the U.S. Senate Energy and Natural Resources Committee
Causes, outlook, and implications of domestic and international energy price trends

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16 November 2021

Senator Manchin, Senator Barrasso and distinguished Members of the Committee, thank you for the opportunity to appear before you today and to present latest data and analysis from the International Energy Agency (IEA) on energy price trends.

Senator Manchin, it is an honour to be here, and at the IEA we remain ready and willing to do everything we can to support the work you and all of your colleagues in the Committee are doing. I take this opportunity to express our gratitude for your personal participation in the work of the IEA's Global Commission on People-Centred Clean Energy Transitions, which presented its findings and recommendations just a few weeks ago.

Sincere thanks also to Senator Barrasso and Members of the Committee for your leadership on crucial issues of energy and natural resources, and the work that you do in favour of a safer and more sustainable energy system for the American people and the world.

At the IEA, we commend your initiative to hold this hearing to examine the causes, outlook and implications of today's energy price trends. The affordability of energy is a major concern to households and businesses across the United States and worldwide. If we lose sight of this, we will not achieve the orderly and rapid clean energy transition that is urgently required to address climate change.

A brief overview of the IEA

Since the founding of the IEA almost 50 years ago, the United States has been a crucial pillar for the Agency. U.S. leadership and support has come from across the government, including the Senate, the House of Representatives, the White House, the Department of State, the Department of Energy and the National Labs. We are delighted that U.S. Secretary of Energy Granholm will be the Chair of our next IEA Ministerial Meeting in the first quarter of 2022.

The IEA was founded in 1974 with a strong mandate to promote energy security, cooperation and well-functioning markets. We have remained true to this original mission but have also evolved since then and expanded to become the world's leading authority on global energy issues. We now provide data, analysis and advice to governments, industry and the public with the aim of shaping a secure and sustainable energy future. Today, the IEA has 30 Member countries as well as partnerships with key Association countries, including the world's largest emerging economies: Brazil, China, India, Indonesia and South Africa. Our IEA family reflects the global nature of energy, accounting for almost 75% of the world's energy consumption.

Recent energy price trends

The historic plunge in global energy consumption in the early months of the Covid-19 crisis in 2020 drove the prices of many fuels to their lowest levels in decades. However, since then, they have rebounded strongly. The starkest example has been Europe's TTF month-ahead price for natural gas, which rose from €3.6/MWh ($1/MMBtu) in 2020 to reach a record of €116/MWh (or $39/MMBtu) in

early October 2021; spot LNG prices in Asia followed a similar trajectory. International coal prices also reached a high point in October, at around five times their level from a year earlier. As of early November, the oil price (Brent Dated) is above $80 per barrel, double the average of $41 per barrel in 2020 and well above the $57 per barrel average for 2015-2019. Higher prices for natural gas and coal have put upward pressure on electricity prices in many markets. The IEA continues to monitor market developments very closely.

Causes of recent energy price trends

There is no single cause behind recent energy price trends. Multiple factors have contributed to the tightening of markets, chief among them being:

- **The rapid economic recovery from the pandemic-induced recession**: This has strained many elements of global supply chains, including those in the energy sector. The global economy is set to grow by around 6% in 2021, its fastest post-recession recovery in 80 years, according to the World Bank. In the first half of 2021, we estimate that global gas demand was growing year-on-year by around 5%, oil demand by 7%, and coal demand by 11%.

- **Weather-related events:** Demand trends have been abetted by a number of weather-related factors. These include a cold winter in the Northern Hemisphere, droughts that curtailed hydropower output in Brazil and elsewhere (resulting in a six-fold year-on-year increase in LNG imports to Brazil), and lower-than-average wind generation in Europe. Hurricane Ida in late August also interrupted U.S. offshore production and damaged platforms and onshore facilities.

- **Outages to supply**: Covid-19 lockdowns in 2020 pushed some maintenance work into 2021, which weighed on supply just at a time when demand was recovering. In the case of natural gas, there were unplanned outages at LNG liquefaction plants, some upstream issues, unforeseen repair works, and project delays that further tightened global markets.

- **Stances of some major suppliers**: In natural gas markets, Russia's Gazprom has been fulfilling its long-term contracts with European counterparts, but it has also reduced its exposure to short-term sales and has not replenished its own storage sites in Europe to the levels seen in previous years. The IEA believes that Russia could do more to increase gas availability to Europe. In oil markets, some 5.8 million barrels per day of spare production capacity is held by major producers in the OPEC+ grouping, a figure that excludes 1.3 million barrels per day of Iranian crude shut in by sanctions.

- **Underlying investment dynamics**: Investments in oil and natural gas have declined in recent years as a result of two commodity price collapses – in 2014-15 and in 2020. This has made supply more vulnerable to the sorts of exceptional circumstances that we see today. At the same time, governments have not been pursuing strong enough policies to scale up deployment of clean energy sources and technologies.

The IEA does not consider that climate policies have played a significant role in the recent run-up in prices. In practice, we believe that more rapid deployment of clean energy sources and technologies could have mitigated some of the upward pressure on fuel prices.

Outlook

The IEA does not have a price forecast for the short or the longer term, but we do provide closely watched assessments of market dynamics across all parts of the energy sector, backed up by the latest available data, as well as longer-term scenario projections for how the energy sector could evolve.

Our overall assessment is that the world remains in a period of unsustainable economic recovery from the crisis triggered by the Covid-19 pandemic, but that some of the extreme recent pressures on prices may be lessening. The very rapid rebound in energy demand in the first half of the year is slowing and is being tempered further by the effects of higher prices and economic uncertainties and by the continuing shadow of the public health crisis caused by Covid-19.

The latest data show, for example, that strong growth in European natural gas demand in the first part of 2021 has reversed since July, while year-on-year natural gas demand growth in China slowed from an average of 15% in July and August down to around 5% in September and October. Slower growth in Chinese economic activity is easing pressure on coal markets, after Chinese coal demand rose more than 10% year-on-year in the first half of 2021. The rise in global oil consumption has been buoyed by strong pent-up demand for travel and from consumers switching away from high-priced coal and natural gas in some sectors, but it is also set to moderate in the fourth quarter of 2021 and into 2022. Higher prices are also providing incentives for producers to bring new supplies to market, although in some cases, the responsiveness to higher prices – including in the U.S. shale sector – may be lower than observed in the past.

Significant near-term vulnerabilities remain, particularly in natural gas markets in the Northern Hemisphere that enter the winter heating season with lower than average storage levels. Temperatures will be an important determining factor for short-term demand, and a cold winter would push up European gas imports and potentially renew acute pressure on international prices.

Looking further ahead, the policies pursued by governments remain a crucial determinant of how supply-demand balances evolve. The IEA's latest World Energy Outlook describes different possible pathways for the future of global energy, differentiated primarily by the strength of the global policy response to the threat of a changing climate.

Our assessment of today's energy investment trends against the requirements of these different scenarios reveals a looming risk of more turbulence ahead for energy markets. Following price collapses in 2014-15 and again in 2020, the amount being invested today in upstream oil and gas is half of what it was seven years ago, and is geared toward a world of stagnant or even falling demand for these fuels. This is one of the very few areas of energy sector investment that is reasonably well aligned with the levels described in the IEA's landmark Net Zero Emissions by 2050 Scenario, which was published in May 2021 and charts a narrow but achievable pathway for the global energy sector that is consistent with a 1.5 °C stabilisation in global temperatures.

Global spending on clean energy technologies and infrastructure has been much more resilient in recent years than spending on fossil fuels and is expected to pick up again in 2021. However, it remains far short of what is required to meet rising demand for energy services in a sustainable way. From around $1 trillion today, worldwide annual investment in a range of clean energy projects and infrastructure would need to more than triple over the coming decade in order to get the world on track for a 1.5 °C future.

Such a surge in spending to boost deployment of clean energy technologies and infrastructure provides the way out of the current impasse, while also bringing down emissions. Accelerating the emergence of a new energy economy will also bring enormous opportunities for growth and employment. However, this change needs to happen quickly or global energy markets will face the risk of further market volatility ahead.

Implications

Today's situation provides an important reminder, especially as the world seeks to accelerate clean energy transitions after the COP26 meeting in Glasgow, of the importance of secure and affordable

energy supplies. This remains a core focus for the IEA, and we look forward to continuing our close collaboration with the United States and other members of the IEA family to this end.

Recent price increases are being reflected in the energy bills being paid by many households and companies around the world. They present broader risks to economic activity, especially for sectors that are directly exposed to the price rises, and contribute to inflationary pressures. Rising power prices have affected the operations of electricity-intensive industries. Several companies have temporarily curtailed ammonia and fertilizer production, citing deteriorating margins due to the sharp increase in natural gas prices.

Price increases have created incentives for fuel switching in some markets, including from gas to coal. For example, despite high carbon prices, gas-fired power generation in Europe fell by 9% year-on-year during the period from July to October, while coal-based generation rose by 11%. However, not all consumers have the opportunity to switch fuels or patterns of consumption quickly in response to changes in relative prices. Choices available to households and many businesses are typically much more limited, underlining that prices are a blunt instrument to generate changes in energy use.

Well-managed policies provide a way to cushion consumers from the effects of commodity price shocks. In rapid energy transitions, households are less reliant on oil and gas to meet their energy needs, thanks to efficiency improvements, switching to electricity for mobility, and moving away from fossil fuel-fired boilers for heating. Reaching this point will require policies that assist households, particularly more vulnerable ones, with the associated upfront costs of efficiency upgrades and low-emissions equipment such as electric vehicles and heat pumps.

Recent developments have also highlighted the importance of flexibility in electricity markets as more solar PV and wind power are added to the generation mix. Thanks to policy and technology progress, as well as low-cost financing, solar PV is now consistently cheaper than new coal- or gas-fired power plants in most countries, and solar projects now offer some of the lowest-cost electricity ever seen. Wind power – onshore and increasingly offshore – is a similar success story.

As the shares of solar PV and wind rise, the rest of the system cannot stand still, and I commend the high priority that this Committee gives to ensuring the security of electricity supply. Low emissions generation from dispatchable sources can play a vital role, providing an opening for technologies like Small Modular Reactors that can ensure the continued support of nuclear power to a low-carbon transition. Adequate investment in robust and smart electricity grids, demand-side responses, and a variety of storage technologies will likewise be essential to ensure a smooth match between electricity supply and demand.

Recent price volatility underlines the strong links between electricity and natural gas markets, as natural gas remains an important means to balance electricity markets in many regions. As clean energy transitions advance on a path towards net zero emissions, global gas demand will start to decline, but it will remain an important component of electricity security. This is especially the case in countries with large seasonal variations in electricity demand.

More broadly, the rapid deployment of clean energy technologies also brings important new resource and security issues into focus, especially the reliable supplies of critical minerals and metals that are vital to energy transitions. Under more ambitious climate scenarios, the energy sector will become a major force in driving demand growth for copper, lithium, nickel, cobalt and rare earth elements. Higher or more volatile prices for critical minerals such as lithium, cobalt, nickel, copper and rare earth elements could slow global progress towards a clean energy future or make it more costly. Price rallies for key minerals in the first half of 2021 have generated upward pressure on the costs of solar modules, wind turbines, electric vehicle batteries and power lines by 5-15%. The leadership of the United States

will be essential to promote timely, diversified investment in these new supply chains, high environmental and social standards, as well as technology innovation and recycling.

Secure and affordable energy transitions will require action across all parts of the energy sector, including heavy industrial sectors and long-distance transport. Finding cost-effective solutions to reduce emissions from sectors like steel, cement, chemicals, freight, shipping and aviation is an enormous opportunity for the United States – with its world-leading research and development expertise – to fill the remaining technology gaps. Innovation remains vital to smooth the pathway to net zero emissions via technologies to enhance the electrification of end uses, such as advanced battery chemistries; or to capture, utilise and store carbon emissions; or to produce and use low-carbon fuels such as advanced biofuels and clean hydrogen.

Finally, the recent price shocks provide a reminder of the deeply interconnected nature of today's energy system, in which no country is an energy island. In that spirit, the IEA remains deeply committed to working closely with the United States and other members of the IEA family to ensure that the much-needed process of change in the energy sector is orderly and rapid – and puts people at its centre.

Senator Manchin, Senator Barrasso and distinguished Members of the Committee, thank you again for the opportunity to appear before you today. And thank you above all for your continued strong partnership and support for the IEA.