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In May I wrote about the emerging energy and food crisis gripping the world due largely to the Russia-Ukraine conflict. The crisis continues to unfold. However, most people are aware of it only via high prices—for gasoline, electricity, natural gas, and food—and through widespread chatter among economists about inflation and what should be done to tame it. Sadly, prices by themselves are not helpful in understanding why the crisis has emerged and how it is likely to develop in coming months. Periodic overviews of the situation that emphasize systemic causal connections and feedbacks may serve that purpose better, so consider this the second in a series of such overviews. I'll sort information and analysis by region.

**Europe and UK: Hungry and Freezing in the Dark?**

In Europe especially, the word "crisis" is fully justified. Sharply curtailed availability of natural gas from Russia will not be fully compensated for by LNG shipments from the US or other gas-exporting countries. Therefore, Europe's leaders are now discussing how to ration existing supplies—and are preparing for a worst-case scenario in which winter weather is particularly severe. Energy bills for European households may surge by 2 trillion euros ($2 trillion) early next year, according to Goldman Sachs (divided equally, that would be nearly $2700 for every adult and child).

The UK is now dealing with the consequences of its neoliberal privatization of utilities (energy, water, and rail), many of which were bought up by nationally-owned utilities in continental Europe. So far, the energy crisis is costing UK households more than those in any country in western Europe. The British government has failed to subsidize the insulation of homes, and households are highly dependent on gas for heating and cooking.

European energy ministers have told political leadership that nations must somehow reduce electricity consumption by 10 percent. Electricity prices are at record levels, with futures prices surging to ten times the past decade's average. At such price levels, whole industries are having to shut down or consider doing so. Germany is importing coal by rail for electricity generation to make up for shortfalls of natural gas that was formerly delivered by pipeline. The country had been in the process of shutting all its nuclear power plants, but has decided to keep the last three online.

European farm and food groups fear that steep natural gas and electricity prices could lead to shortages of fruit and vegetables by forcing companies to

curb production. Refrigeration is electricity intensive, and the heating of greenhouses often relies on natural gas.

In addition to electricity generation, natural gas is used for industrial purposes, often to supply high levels of heat for metallurgy, as a feedstock for chemicals, and for the manufacture of fertilizers. Compared to the US, Europe has relied more on manufacturing and heavy industry for its economic output in recent decades, so the impact of high prices on EU economies will likely be more systemic. According to reports, roughly half of steel, aluminum, and zinc production in the EU is already shuttered and facing an existential crisis.

Natural gas is also used to heat homes and buildings, and it is this application that is likely to cause the most direct discomfort to the largest number of ordinary people. Firewood is suddenly in critically short supply in France, Germany, and other countries. High gas prices through the winter raise the potential for protests and social unrest (Slovenia and Czechia are already seeing them). Governments are trying to head off that risk with caps on the electricity rates that residents will actually be charged. But price caps will leave governments on the hook for the difference between generating costs and what households pay, possibly leading to huge spending deficits over the short term. Leaders hope to minimize deficits by heavily taxing energy companies.

One visibly prominent gauge of the seriousness of the electricity crisis in Europe: the mayor of Paris has said that lights on the Eiffel Tower will be turned off several hours earlier than usual in order to save energy.

**North America: Excused for Now**

So far, Americans have been spared the brunt of the energy crisis. Indeed, motorists have recently enjoyed lower gasoline prices due to a slump in the cost of oil, due in turn to a fall in demand from China (see below) and fears of an economic slowdown. The US is somewhat insulated from energy supply problems because it is currently the world's foremost producer of oil and natural gas, and has the lowest domestic natural gas prices of any industrial country except Canada.

Since March, at the discretion of President Biden, the US has been drawing down its Strategic Petroleum Reserve by a million barrels per day to moderate oil prices. But the SPR is now at its lowest level since 1984, and there is talk of stopping withdrawals in October and starting to refill it if oil prices continue to fall. Of course, this would put some upward pressure on oil prices. As always, demand is as important as supply in determining the actual price: if a recession begins, that would reduce demand, lowering oil prices.

Global supplies of crude have remained mostly stagnant recently (after crashing, as a result of depressed demand, during the COVID pandemic in 2020). Earlier this year, after some groveling by Biden, OPEC promised a short-term bump in output, and Saudi Arabia has indeed pumped more. But OPEC as a whole has seen better days. August's crude-only OPEC production clocked in at about 30 million barrels per day, which is over 2 million barrels per day below the high 12-month average that OPEC reached in August 2017.

Over the short run, America's biggest fuel supply problem is likely to center on diesel, inventories of which have been declining for months and are poised to fall even further if refiners continue to export large amounts to Europe, Latin America, and Asia. Diesel, lest we forget, is the fuel of commerce.

Meanwhile, US oil production is struggling to grow. Output from the Permian Basin (the last remaining region where fracking might yield higher extraction rates) is at a record high, but elsewhere production is falling. The time is fast approaching when the Permian will no longer be able to offset declines elsewhere, and total US production will decrease, as it did during the decades from 1970 to 2010. America's ability to extract oil is a global economic issue, since there's hardly anyplace else capable of increasing production and hence lowering prices. With oil prices high, one might expect a drilling frenzy in the US fracking patch, but there's little sign of one. That's partly due to demands by investors for oil companies to pay dividends rather than spend more on drilling. It's also partly a result of spiking materials prices: the cost of steel pipe has soared in recent months. It's simply getting more expensive to drill.

Annual inflation in the US is still running at over 8 percent, which is causing conniptions at the Federal Reserve. The Fed has only one main tool with which to intervene in the economy—interest rates—and the effectiveness of that tool is likely to be minimal in fighting inflation that's being caused by novel events having little to do with the usual business cycle. Indeed, higher interest rates risk triggering a recession at least, and a debt default crisis at worst. Fed chairman Jerome Powell recently admitted that reducing inflation is likely to inflict pain on households and businesses—including higher unemployment rates and lower profits.

As a result of the fracking revolution, the US has become the world's top liquefied natural gas (LNG) exporter, and has been throwing lifelines in Europe's direction (gas producers are happy to help if it means getting a higher price for their product). However, this has raised domestic natural gas prices, which are nearly three times last year's level. (Note to Jerome Powell: higher interest rates won't fix this.) With their production levels already maxed out, US shale industry executives have told European leaders that an increase in LNG exports is not in the cards. Plus, there's a tanker shortage. US natural gas inventories are very low for this time of year, and, given the high LNG demand expected this winter, domestic supplies could be insufficient.

**Russia and Ukraine: The Crux of the Matter**

So much hinges on the course of the Russia-Ukraine war. If it drags on, so will the global economic pain, which could deepen dramatically this winter. If the war were to end soon, near-term economic risks could lessen substantially.

For Russia, the war is going badly, following humiliating defeats during a Ukrainian counter-offensive early this month. Local Russian officials have taken the brave step of urging Vladimir Putin to resign, though many of his domestic critics are hardliners who say he is not prosecuting the war ruthlessly enough. During the first couple of months after the invasion, Russia's economy seemed resilient in the face of severe sanctions on the part of the US, Britain, and the EU, largely as a result of high oil prices. While

Russia's oil exports to Europe are way down, those exports have largely been redirected to China and India, and high prices have partly made up for sanctions. As time wears on, though, the economic impact of sanctions is deepening. Russia is suffering a brain drain as talented people exit the country, and a leaked internally-produced Russian governmental report concludes that Western sanctions are in fact having devastating results. There is a small, though not insignificant, possibility of Putin losing power, which might unleash political instability within Russia.

Even though Russia has been able to export oil to China and India, its oil production is expected to fall 2 percent in 2022 and will likely continue declining in coming years, largely due to lack of investment and expertise following the departure of Western oil companies and oil service providers. Even if the war ends soon, Russia's role in the global oil industry is forever changed. It is now a fading energy giant, and will need new pipelines or tanker loading terminals to move its product east and south instead of west.

For Ukraine, the energy crisis is only one of the hardships that war has brought. Recently, the country's largest nuclear power plant suffered shelling damage and risked meltdown. Fortunately, power to the reactors has been restored, making the worst outcome less likely, at least for the time being. However, Russia has since also shelled other power plants, leaving thousands of Ukrainians without electricity, even as their country has been exporting power to Europe. Energy planners are having to get creative, with a much reduced population (after millions fled in the face of the invasion) and therefore periodic surplus electricity generating capacity on one hand, but with constant threats from Russia to the grid and power stations on the other.

**China and India: Coal and COVID**

China's oil consumption has fallen more this year that at any time in the past three decades due to renewed COVID-19 lockdowns—part of the country's "zero-COVID policy"—and a property crisis that together have slowed economic growth to a crawl. From a global perspective, China's depressed demand is the main source of downward pressure on oil prices. The International Energy Agency estimates that Chinese oil consumption will plunge a startling 2.7 percent this year. As a result of lower domestic demand, the country's gasoline and diesel exports are surging.

With the output of some of its hydroelectric dams now threatened by drought, China is investing in more coal mines and more coal-fired power plants, even as it also installs solar panels and wind turbines at record rates. This follows roughly eight years of slowed growth in coal dependency, starting in 2014. China is committed to building 270 gigawatts of new coal-fueled power plants during the next five years—the equivalent of one huge (1,000 megawatt) plant each week during that period. Much of the coal will be sourced from the world's largest open pit mines in Inner Mongolia and shipped via the new $30 billion Haoji railway.

India is likewise building more coal-based infrastructure, with up to 28 gigawatts in new power plants needed by 2032, according to a national advisory body. The country's electricity demand is projected to double in the next decade. India's determination to pursue more coal dependency is only stiffened by higher international LNG prices brought on by higher European

demand, in turn brought on by the Russia-Ukraine war.

World coal consumption has been on a plateau since about 2010 (and fell during the first half of this year), but plans by China and India for expanding coal-based power generation could result in global coal usage rates reaching new heights—if (or as long as) physical resources permit. Parts of India are already subject to periodic blackouts due to heat waves and insufficient coal supplies. Even though Coal India is the world's largest coal company and has increased extraction rates by 12 percent in recent months, plans for greatly increased consumption of the fuel depend on the availability of imports from Australia, Indonesia, and other countries.

**Africa: Food Prices and . . . More Coal**

Nigeria, for many years the continent's foremost oil producer, has seen its production decline due to depletion, and its exports collapse due to theft of fuel and pipeline vandalism. Angola and Libya have overtaken Nigeria as top producers, though these countries face problems of their own in expanding production or even keeping it steady.

Egyptian energy officials claim the country has sufficient natural gas resources to weather the energy crisis, but have announced a strict plan to ration energy consumption, including reducing street lighting and regulating the use of air conditioners in public buildings.

South Africa, the continent's third biggest economy after Nigeria and Egypt, is heavily coal dependent, but hoping to change that with a Just Transition Framework agreement with the US, UK, and the EU to unlock $8.5 billion of investment in energy alternatives. According to a study conducted by COP26, South Africa will need to spend over $250 billion over the next 30 years to kick its coal habit. However, as a result of the Russia-Ukraine war, South Africa's coal exports to Europe have surged, and prices have reached unprecedented highs, incentivizing more mining and providing more income for the country.

South Africa's state-owned power utility, Eskom, has cut power to its customers on 100 days so far in 2022, with more blackouts to come. Eskom is struggling to meet electricity demand because its old and poorly maintained power stations continually break down. The energy shortages hurt businesses, and have contributed to a contraction in the economy.

Over all, the biggest impact of the energy crisis on Africa is via food. East Africa (Ethiopia, Somalia, Kenya) is facing famine largely as the result of an epic drought. On top of this, grain prices have increased significantly this year. In March, prices were shooting up alarmingly, but they've moderated somewhat since then (though they're still at historically high levels). Much hinges on crop harvest prospects for this year and next. Maximo Torero, chief economist of the Food and Agriculture Organization (FAO) of the United Nations, recently told Bloomberg TV that unaffordable fertilizer prices (due to soaring natural gas prices) could reduce global grain production by up to 40 percent in the next planting season.

**Elsewhere in Brief**

*Australia:* Coal and gas companies are profiting mightily from exports, while

ordinary Aussies pay extra.

*South and Central America:* High fuel prices are yielding higher profits for exporting countries (Brazil, Mexico, Colombia, Venezuela) but threaten political stability in Chile, Argentina, Ecuador, and other nations.

*Japan and South Korea* are turning to nuclear power in response to high fuel prices.

*Middle East:* High fuel prices—that's good news, right? According to the IMF, Middle Eastern states will rake in a $1.3 trillion windfall in extra revenues as a result of the energy crisis.

**Conclusion: A Global Learning Opportunity**

The Russia-Ukraine war is a tragedy all around. For the people of Ukraine, it is a fight for the right to exist. But due to the issues of global energy supply that the war has raised, suffering is occurring, and will occur, far beyond the zone of conflict. This winter will reveal the scope and depth of that suffering.

This winter will also show how countries control demand in order to deal with stagnant or shrunken energy and food supplies. If prices and interest rates are the only mechanisms for adaptation, suffering will be greater. If supplies of energy or food are rationed, suffering will likely be less. The fact that European politicians are discussing rationing is an indication of the seriousness of the situation, but also suggests a cooperative and fair way of dealing with scarcity. Rationing should occur not just between nations, but also at the household level. Scarcity will be inevitable in coming years as the world's oversized industrial economy crashes against nature's limits. The sooner we learn to respond creatively to scarcity via rationing, the less pain will have to be endured.

Near-term impacts of climate change are a wild card in this deadly game. By throwing power plants offline, by increasing social conflict in countries that produce energy, or by reducing harvests in breadbasket regions, floods, heat waves, wildfires, and droughts could make a bad situation much worse.

In this article, I haven't discussed the potential for renewable energy sources to make a significant difference in the global energy supply picture. That's the subject of a separate article.

Every discussion about energy should begin or end with a reminder that building a global industrial economy on the basis of ever-increasing rates of extracting and burning finite fossil fuel resources, with polluting byproducts, was and is utterly insane. It's within the context of that understanding that we should view the details of how economic growth ends and reverses itself over the coming years. Maintaining this bigger view could help prevent all sorts of unnecessary blundering and suffering.