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This article is from the April 2022 issue of *EEnergy Informer*, a newsletter edited by Fereidoon Sioshansi of [Menlo Energy Economics](#) and editor of Variable Generation, Flexible Demand.

Politicians across Europe were faced with the unexpected, and apparently unimaginable, as Russian tanks rolled across the Ukrainian border on 24 February. In retrospect, the energy crisis facing import-dependent economies of Europe should have been among possible scenarios considered and planned for. Every expert worth his/her name, would tell you not to put all, or even most, of your eggs in one basket – for example, to be overly dependent on a single country, company, pipeline, or delivery network for the bulk of your critical supplies. Even more so if the supplier has had a history of being unreliable, occasionally cutting supplies when you need it the most, threatening to do so, or rising prices unexpectedly. Russia's **Gazprom** has done all these things over the years, and yet most European countries continued to rely on it for a substantial portion of their needs. They are now struggling to diversify – with few practical options in the near term.

One is reminded of the words of the former US secretary of defense, Donald Rumsfeld, who famously said (emphasis added):

“Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns—the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter category that tends to be the difficult ones.”

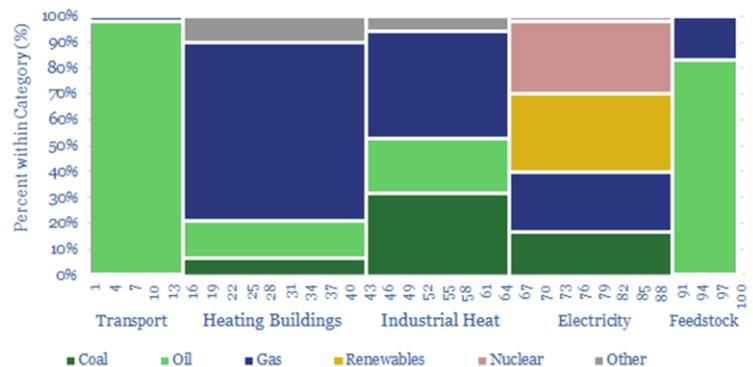
As this editor sees it, the current situation falls into the first 2 categories, depending on one's perspective. Especially now, it is hard to argue that Putin's aggression is an *unknown unknown*, even if unexpected by standards of ruthless autocrats.

A convenient way to get the big picture is to ask how much energy does Europe use and for what? Rob West of Thunder Said Energy (TSE) offered a useful synopsis in a 15 Feb post, before the invasion. According to West, who examined 25 industries in 28 countries, Europe used 12,000TWhs of energy in 2019 as shown in the visual on top.

Rob West says, “Europe's energy, weighted by ‘useful TWH’, is 36% gas, 32% oil, 13% coal, 7% nuclear, 4% wind, 3% hydro, 1% solar. This re-iterates why gas shortages have a disproportionate impact.”

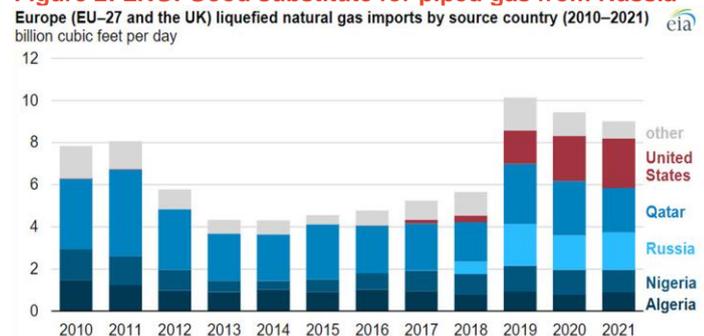
The above visual also shows which sectors are particularly vulnerable to shortages or disruptions of gas, namely building heating sector, industrial heat and electricity generation – the actual numbers vary from country to country. If gas supplies are cut off, many Europeans households would literally freeze in the cold winter months. Natural gas used for power generation is rather low in both Germany and France.

Figure 1: Critical European sectors dependent on imports from unreliable sources



Source: Rob West, Thunder Said Energy, 15 Feb 2022 post

Figure 2: LNG: Good substitute for piped gas from Russia



Source: EIA

Where was the gas coming from before the invasion? According to the Energy Information Administration (EIA), a lot was coming from Russia through pipelines, most of which go through Ukraine, a proportion that has *increased* in recent years. Not surprisingly, the recent supply challenges have led to rising prices for natural gas in European markets, exceeding the LNG prices in Asia, where most LNG was traditionally exported to. With prices higher in Europe, some LNG traffic has shifted to Europe, but not enough due to the lack of terminal and storage capacity in critical markets including Germany. LNG is usually imported through long-term contracts and needs degasification terminals and storage and pipeline capacity, which are currently insufficient in northern Europe.

The EIA says that in 2021, roughly 70% of Europe's LNG originated in the US, Qatar, and Russia. As it happens, the US became Europe's largest source of LNG in 2021, accounting for 26% of all LNG imported by EU-27 and the UK, followed by Qatar with 24%, and Russia with 20%. In Jan 2022 as Putin began his troop build-up on the borders of Ukraine, the US supplied more than half of all LNG imports into Europe. Nobody in his right mind would want to depend on Russian gas moving forward.

Not surprisingly, the crisis has served as a wakeup call to politicians across Europe, many of whom are wondering how they got into the mess they are in (Box). Even before the crisis, Germany's government was debating how to make the country's power supply almost 100% renewable by 2035. Now there is talk of accelerating that target to 2030 – which seems impractical. In the meantime, the immediate reaction to the possible reduction or curtailment of Russian gas deliveries to Germany, minister Robert Habeck said that Germany's gas reserves will last for this winter and summer – but securing supply for next winter would demand new procurement sources and weaning the German economy from its appetite for gas.

How did Germany get into the Russian gas mess that it is in?

Commenting on the articles about Ukraine, Russia and the German gas dependency in the March 2022 issue of this newsletter, Prof. Dr.- Ing. Christoph Menke of University of Applied Sciences Trier in Germany wrote (edited and abbreviated):

"You are correct to say that Germany depends far too much on Russian gas, because it was so easy and there were major business interests by German companies who invested in Russian gas companies. The problem, which has been known for some time results in the EU paying some 700 Million Euros per day for gas, oil and coal to finance Putin's war, i.e., the EU is inadvertently financing the war against Ukraine."

"The challenge with the gas is not its use in power generation, which is only 10-15% of all power generation energy in Germany but for heating homes and in industry. It was pushed by German business, the chemical industry and German boiler suppliers who are the major manufactures of gas boilers for the whole of Europe. This was done with the government's full consent."

"Homes, of course, can be heated without gas, as Denmark has done, where gas boilers were more or less banned starting in 2013 and replaced by local district heating networks with solar heating, storage for heat, wind power, large heat pumps and biomass heating boilers. This is what Germany and the rest of EU need to do."

"As for alternatives to Russian gas, substitutes from the US or Qatar make no real sense for the longer run, given the methane leakage from fracking gas in the US, which makes it even worse than burning coal directly or from Qatar which cannot be considered a reliable trade partner."

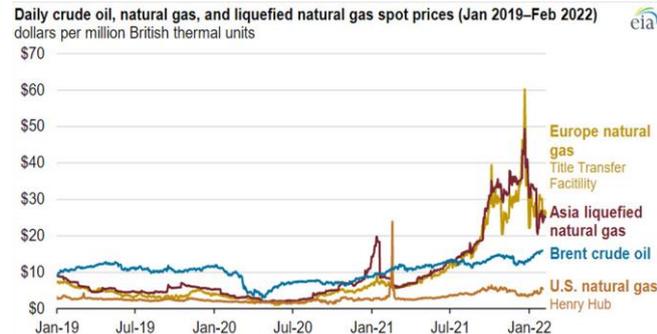
"The new German government wants to convert 50% of the heating demand to renewable energy by 2030 by using heat pumps and local heat networks in addition to forbidding new oil and gas heating by 2024 – ambitious and absolutely necessary."

"There has been a plan to get to 80% renewable power by 2030 and 100% by 2035 for all power demand in Germany. But the government was not actively pursuing the plan in the recent past while the utilities wanted to keep control on existing power generation as they do everywhere. This crisis will hopefully make it clear what needs to be finally done."

In this context, Vladimir Putin's war against Ukraine has awakened many a complacent politician to the danger of over-reliance on Russia gas. In the short run, any substitute, more LNG imports from the US or Qatar, or increased use of coal will do. In the longer run, European countries must re-examine the known knowns, the known unknowns and possibly even the unknown unknowns.

There are significant costs associated with complacency and Putin has dramatically altered the thinking and perhaps stiffened the political resolve.

Figure 3: Energy prices were rising even before the war



Source: EIA