



# IEEJ e-NEWSLETTER

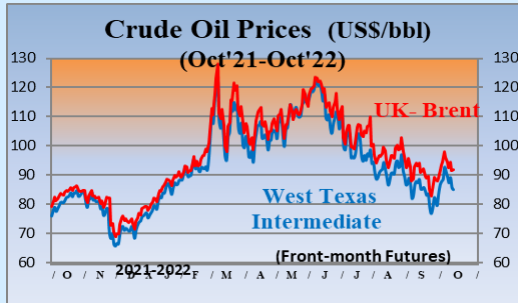
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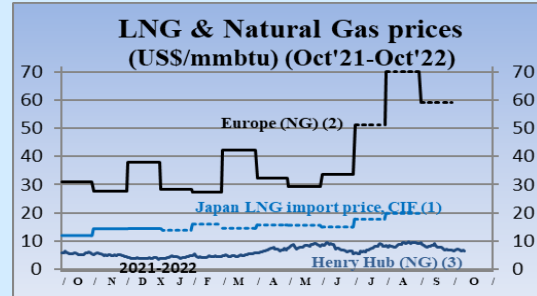
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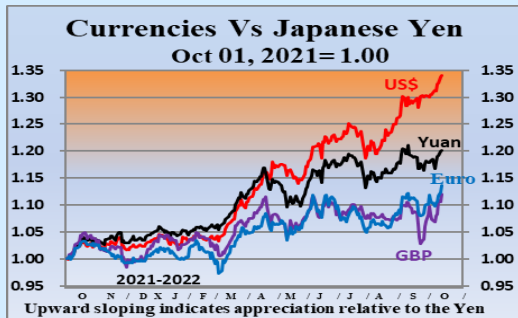
(As of October 17, 2022)



Sources:  
 (1) DOE-EIA  
 (2) Investing.com



Sources:  
 (1) Ministry of Finance "Japan Trade Statistics"  
 (2) Ministry of Economy, Trade and Industry (arrival month basis)  
 (3) Estimated by World Bank (Netherland Title Transfer Facility)  
 (4) DOE-EIA, NYMEX (Front-month Futures)



Source: x-rates.com



Sources:  
 (1) Finance. Yahoo.com  
 (2) Investing.com

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## Summary

### **1. Developments in Nuclear Power**

In its report, the IAEA called for an immediate halt to the shelling of the Zaporizhzhia nuclear power plant and suggested that the surrounding area be designated a safe zone. Japan saw progress in international cooperation on research and development of a new reactor technology.

### **2. Recent Developments in the Oil and LNG Markets**

Risks of a price surge in the oil market remain with uncertain factors surrounding Russian developments. Long-term LNG development activities continue for non-Russian regions.

### **3. Update on Climate Change, Energy Conservation, and Renewable Energies**

The U.S. state of California has adopted rules that would require all new car sales in the state to be 100% zero-emission vehicles by 2035. The Tokyo Metropolitan Government announced a policy requiring the installation of solar panels on all new houses in Tokyo.

### **4. Europe and US: Power Supply-Demand Balance Tightens throughout Europe and the U.S.**

In the U.S., the supply-demand balance appears to be tightening in Texas and California, as well as in Europe, as export capacity declines. In Europe, energy-saving measures in preparation for winter are urgently needed.

### **5. China: Accelerating Nuclear Power Development, but Securing Absolute Safety Is an Issue**

The State Council issued construction permits for 10 units at five nuclear power plants on two separate occasions, in April and September. The total capacity, including those awaiting start of construction, amounts to 85 units totaling 90.83 GW. The key challenges are ensuring absolute safety and constructing radioactive waste disposal facilities.

### **6. ME: Protests Grow in Iran as Nuclear Talks Stall**

Iranian President Raisi's attendance at the UN General Assembly raised hopes for progress in the negotiations to revive the nuclear deal, but around the same time, protests erupted and spread across the country, prompting the Biden administration to strengthen sanctions against Iran.

### **7. Russia: President Putin Faces Difficulties but Remains Aggressive**

The Russian military continues to struggle, forcing a "referendum with consequences" in parts of eastern Ukraine, while the Putin administration, which has issued a partial mobilization order and hinted at the possibility of using nuclear weapons, is facing renewed domestic opposition.



## 1. Developments in Nuclear Power

**Emiri YOKOTA**, Senior Researcher  
Nuclear Energy Group, Strategy Research Unit

On September 6, the IAEA released a report summarizing the findings of the team of IAEA experts who were conducting an investigation at the Russian-controlled Zaporizhzhia Nuclear Power Plant in southern Ukraine. The report confirmed that the shelling had caused damage at several locations, including nuclear fuel and radioactive waste storage facilities. It also noted that, under the control of the Russian military, plant workers are striving to ensure safety under conditions of extreme stress. Accordingly, the report proposed that the nuclear power plant area be designated a safe zone, while also demanding an immediate halt to the shelling, emphasizing that “until the conflict is over, interim measures must be put in place to prevent nuclear accidents that may result from the attacks.”

On September 11, Energoatom, Ukraine’s state-owned nuclear company, announced that it had shut down Unit 6, the only operating reactor at the Zaporizhzhia NPP, which is occupied by the Russian military. It explained that the decision to shut down the unit was made after part of the transmission line was restored. There are apparently no problems with the cooling of the reactor and other aspects of maintaining reactor stability at present. Since the shutdown of Unit 5 on September 3, multiple transmission lines connecting the power plant to the outside have been damaged, making it difficult to secure an external power source to cool the reactors in an emergency. As such, Unit 6 has been providing the power necessary to maintain the safety of the entire Zaporizhzhia Nuclear Power Plant. If the shelling continues and the external power source is lost, the reactors will have to be cooled using emergency diesel generators. Since fuel for the generators is also limited, the situation must continue to be monitored closely.

In a major development in Europe, the German Federal Ministry for Economic Affairs and Climate Action decided to conduct stress tests on the stable supply of electricity and stable grid operations. The two stress tests were completed by early September. The three remaining reactors in Germany were previously scheduled to be decommissioned by the end of this year, but after the stress tests, it was decided to keep two of the three reactors in operation as backup capacity until April 2023.

The UK is scheduled to implement the Advanced Modular Reactor (AMR) Research, Development and Demonstration Programme, aiming to demonstrate High Temperature Gas Cooled Reactor (HTGR) technology by the early 2030s. On September 5, the Japan Atomic Energy Agency (JAEA), which has a collaborative relationship with the UK National Nuclear Laboratory (NNL) in the field of HTGR technologies, announced that it was selected as the project entity to implement the AMR RD&D program as a member of the NNL team. Through participating in the program in cooperation with NNL, JAEA aims to upgrade Japan’s HTGR technology developed through the construction and operation of the High Temperature Engineering Test Reactor (HTTR), and demonstrate its HTGR technology in the UK to achieve international standardization. This initiative aims to strengthen Japan’s international competitiveness in this field; its future progress deserves close attention.

On September 22, at the 31st meeting of the Nuclear Energy Subcommittee, the Agency for Natural Resources and Energy proposed once again considering extending the lifetime of existing reactors and rebuilding the research and development framework for next-generation reactors.



## 2. Recent Developments in the Oil and LNG Markets

**Hiroshi HASHIMOTO**, Senior Analyst  
Head of Gas Group  
Fossil Energies & International Cooperation Unit

The OPEC+ oil producers agreed on 5 September to cut their production in the month by 100 thousand barrels per day (B/D) in the month. The cut effectively nullified the increase of the same volume agreed in August. But WTI briefly declined to the USD 70s due to a fear of the global economic slowdown. The U.S. Federal Reserve Board (FRB) on 21 September decided to increase its benchmark interest rate by 0.75% for the third time, to reduce inflationary pressures, with the U.S. dollar getting stronger and the stock markets destabilized.

Russian crude oil export increased by 220 thousand B/D to reach 7.60 million B/D in August, as Western nations' import declines continued being offset by increasing imports by China, India and others. On 2 September, G7 finance ministers agreed to impose a cap on prices of Russian oil from December. As Russia's president has suggested potential halts of energy exports to those nations participating in the scheme, there remain risks of another surge of crude oil prices.

Japan's average LNG import price was close to JPY 139,371 per tonne in August 2022, the highest ever again after the previous high in July. The price measured in the U.S. dollars in August was also the highest in the history approaching USD 20 per million Btu, surpassing the previous record in July 2012.

Uncertainty continues over Russian gas supply in both Pacific and European regions. Pipeline gas flows through the Nord Stream pipeline into Germany stopped in late August for ad-hoc maintenance and had not returned yet when the pipes were damaged in late September. The two Japanese partners have joined the new Russian entity that has taken over the Sakhalin 2 LNG project, although Shell did not. The next question is who will take over the share and what would be the impact of the transfer.

With the relatively smooth build-up of gas storages in the European Union, the TTF gas price declined from the high of nearly USD 100 per million Btu oil equivalent in late August to the USD 50s in late September. However, it was nearly twice as high as that of a year ago, as anxiety continues over supply toward the coming winter.

Activities continue to secure long-term gas and LNG around the world. Cheniere Energy, the current largest LNG exporter in the United States, revealed in its long-term investment plan a potential goal of 90-million-tonne-per-year capacity through expansions at its two LNG export plants on the coast of Gulf of Mexico. The company has already started regulatory processes for additional two mid-scale trains at its Corpus Christi Liquefaction site in Texas.

In Western Australia, Woodside Energy, the operator of North West Shelf LNG, has published the final Environmental Impact Statement (EIS) for the Browse-to-North West Shelf (NWS) Project as directed by the authority. The project would send gas to the NWS plant, with production capacity of 11.4 million tonnes per year (of LNG, LPG and domestic gas combined). A feasibility study is also planned for a potential CCS project at one of depleted fields of the NWS ventures.



### 3. Update on Climate Change, Energy Conservation, and Renewable Energies

**Tomoko MATSUMOTO**, Senior Researcher  
Renewable Energy Group  
Electric Power Industry & New and Renewable Energy Unit

In addition to efforts by central governments, the policies of regional governments to promote decarbonization are critical to achieving carbon neutrality. For example, the U.S. state of California has actively taken decarbonization measures. On August 10, the California Energy Commission announced a target to deploy 3 to 5 gigawatts of offshore wind power by 2030 and 25 gigawatts by 2045. The state of California has set a goal of achieving 100% clean electricity by 2045. Offshore wind power is expected to contribute to reaching this goal.

Then, on August 25, the California Air Resources Board approved rules that would require all new car sales in the state to be 100% zero-emission vehicles (ZEVs) (including plug-in hybrids, EVs, and fuel cell vehicles) by 2035. The percentage of zero-emission vehicles in new vehicle sales will be raised gradually from 35% in 2026, and after 2035, sales of new gasoline vehicles, including hybrids, will be banned.

Regional governments in Japan are also making progress in their decarbonization efforts. The Ministry of the Environment will allocate 5 billion yen in its FY2023 budget request to the subsidy program for projects to support planning for the maximum introduction of renewable energy to help municipalities decarbonize. Eligible projects include those that contribute to setting regional renewable energy targets and formulating ambitious regional decarbonization initiatives, implementing regional decarbonization activities, and supporting capacity building for decarbonization. This subsidy program, a significant increase from the FY2022 budget of 800 million yen, will strengthen support for regional governments.

On September 9, the Tokyo Metropolitan Government revealed the basic policy for revising its ordinance systems to halve its carbon emissions, aiming to reduce Tokyo's greenhouse gas emissions by 50% (compared to 2000 levels) by 2030. In addition to strengthening the existing measures, a new system provisionally called "Environmental Reporting System for Buildings" will be established. The system will set insulation and energy-saving performance standards for certain new, small- and medium-scale buildings (houses, etc.) for home developers and builders supplying a total residential floor space of 20,000 square meters or more per year in Tokyo, and make it mandatory to install solar panels on new houses. In addition, subsidies will be provided to encourage the installation of solar power generation equipment. The Tokyo Metropolitan Government aims to enforce the system from April 2025.

The G20 Environment and Climate Ministerial Meeting and the Energy Transitions Ministerial Meeting were held in Bali, Indonesia on August 31 and September 2, respectively. According to press reports, both meetings failed to agree on a joint communiqué, with Russia, China, India, and others disagreeing with G7 countries over references to Ukraine, climate finance, methane emissions, international shipping, carbon border adjustment, and whether a temperature goal should be 1.5°C or 2°C. In Japan, on September 6, the first meeting of experts on emissions trading in the GX (green transformation) League was held to discuss the concept of such emissions trading. The second meeting of experts will be held in the fall, at which the secretariat's proposal will be presented based on opinions from companies. The emissions trading rules are scheduled to be formulated by the end of this year, to be fully implemented starting in FY2023.



#### **4. Europe and US: Power Supply-Demand Balance Tightens throughout Europe and the U.S.**

**Junichi OGASAWARA**, Senior Research Fellow  
Assistant Director  
Electric Power Industry & New and Renewable Energy Unit

In Japan, the U.S., and Europe, electricity markets are becoming less resilient to shocks such as natural disasters due to a decline in surplus supply capacity. This section summarizes the current tight power supply-demand situation in Europe and the United States.

In the U.S., Texas' ERCOT issued a power conservation request on July 13 due to increased demand caused by a heat wave. In July, electricity demand hit nearly 80 gigawatts almost every day, whereas the typical demand during the summer season is around 70 gigawatts. In California, after a warning was issued on August 17 due to a heat wave, demand increased again in September, resulting in warnings being issued every day from the 1st to the 9th and a level 3 emergency being issued on the 6th, placing the state on the verge of planned power outages. A level 2 emergency was also issued on the following day, the 7th, invoking the emergency program, but planned power outages were avoided on both days. In California, it is difficult to build even a new natural gas-fired power plant, with renewable power generation and storage batteries being the only source of new capacity. As a result, the supply and demand balance may become tight every summer in the near term.

Europe also experienced a heat wave from June to August, which tightened the supply and demand of electricity. As Europe does not have a mechanism similar to the “electricity forecast” of Japan, it is impossible to know how much supply capacity is remaining. In the United Kingdom, which is the only country that publishes the day's supply capacity and outage probability in the BM Report provided by Elexon, more than 70% of all days during the period from June to August had a positive outage probability (namely, there was a possibility of an outage) on an hour-ahead basis. This was largely due to France turning into a net importer from mid-June as nuclear outages increased and available installed capacity dropped to less than 25 GW in late July. The heat wave also made it difficult to use water and reduced the available installed capacity of power plants and hydroelectric power stations built in riverine areas, reducing the number of countries with export capacity. As Germany, too, has been holding back on natural gas-fired power generation considering the cost of purchasing natural gas, the supply-demand balance of electricity has been tight throughout continental Europe.

On September 15, the European Commission released a draft regulation on emergency intervention in response to high energy prices, which includes the key strategies of: (1) curbing electricity demand, (2) applying a cap on electricity sales revenues for most power generation facilities except for natural gas-fired and general coal-fired power plants, which are peak sources, and (3) collecting contributions from surplus profits made by fossil energy companies. Since the draft regulation does not curb increases in wholesale electricity market prices per se, even this proposal is likely to have limited effect on improving the deficits of retail operators and curbing the skyrocketing electricity prices paid by consumers. While the caps and compensation for price differences for power producers purchasing natural gas in Spain and Portugal have helped to curb the soaring wholesale electricity market prices in those countries, other countries lack the funds for providing such compensation, and have apparently decided to first secure the resources needed to implement the measure. Due to the possibility that French nuclear power may not be sufficient this winter, December futures for France topped 1,500 euros/MWh on September 23. Power-saving measures must be implemented urgently heading toward the winter.



## 5. China: Accelerating Nuclear Power Development, but Securing Absolute Safety Is an Issue

Li ZHIDONG, Visiting Researcher  
Professor at Graduate School  
Nagaoka University of Technology

On September 13, Prime Minister Li Keqiang chaired a meeting of the standing committee of the State Council. In the meeting, the government gave the green light to expansion of the Zhangzhou Nuclear Power Plant (NPP) in Fujian Province with two units (Units 3 and 4) and the construction of two units (Units 1 and 2) at a new plant, Lianjiang NPP, in Guangdong Province, to increase China's energy security capability and promote green development. Combined with the six units at three NPPs approved on April 20, construction permits have been issued for 10 units at five NPPs (totaling 12.32 GW) this year, far exceeding the five units at three NPPs (totaling 5.22 GW) approved last year.

Since 2011, China has failed to meet the nuclear power development target in its Five-Year Plan for two consecutive Plan periods. The 2020 target was a total capacity of at least 88 GW (including at least 30 GW under construction), but the actual capacity constructed was just 68.42 GW (including 18.54 GW under construction). According to the National Nuclear Safety Administration and other sources, as of August 2022, there were 54 units in operation with a capacity of 55.81 GW and 23 units under construction with a capacity of 25.20 GW, bringing the total to 77 units with a total capacity of 81.01 GW. The 2020 target has yet to be achieved. Meanwhile, the 14th Five-Year Plan set a target of 70 GW in operation by 2025 by promoting development in coastal areas actively and with discipline, on the premise of ensuring safety. No new targets were set for the start of construction as it involves high uncertainty. Since the NPPs that have received construction permits from the State Council will be built at some point, the total capacity, including those that have been authorized and are awaiting the start of construction, is estimated to be 85 units with a capacity of 90.83 GW as of the end of September. Thus, China is accelerating its efforts to develop nuclear power plants.

Why is this? Although it is a carbon-free power source, nuclear power has not become more cost competitiveness than solar PV, wind, and other renewable power sources, which are becoming cheaper than thermal power. The trend is due to the fact that power supply shortages and slowing economic growth have become more pronounced since the beginning of the year, forcing the government to increase the role of nuclear power plants, which provide both a stable power supply and an economic boost. Guosen Securities estimates that the 10 nuclear power plants approved this year will all be domestically-produced third-generation reactors, with a relatively large investment of 18–20 billion yuan (1 yuan = 20 yen) per unit and a total investment of 180–200 billion yuan. Half of the total investment is in facilities, whose domestic production rate is estimated to be 85% or more for CAP 1000 (6 units, 7,500 MW) and 90% or more for the HUALONG1 (4 units, 4,820 MW), and thus most of the investment will contribute to expanding domestic demand. This suggests that nuclear power plant investment is extremely effective for expanding domestic demand, as was the case with the investment in variable renewable energy, which is now completely domestically-produced.

Meanwhile, the biggest challenge for the development of nuclear power is ensuring absolute safety, which is also essential for the stable supply of electricity. Since the Fukushima nuclear accident in Japan on March 11, 2011, the Chinese government has been promoting the construction of third- and fourth-generation nuclear reactors that feature excellent safety. According to the China Nuclear Energy Association, Sanmen NPP Unit 2 (AP1000) in Zhejiang Province began commercial operation on November 5, 2018, but was shut down from December 22, 2018, to November 21, 2019 due to a failure. Taishan NPP Unit 1 (EPR) in Guangdong Province started operation on December 13, 2018, but by April 5, 2021, four level-zero incidents with no radioactive material leakage occurred, including shutdowns due to external power grid failures and fuel rod damage, resulting in shutdowns from July 31, 2021 to August 14, 2022. Shidaowan NPP Unit 1 (a high-temperature gas-cooled reactor) in Shandong Province underwent initial fuel loading on August 21, 2021, but has not been in commercial operation as of June 30, 2022. Two HUALONG1 units are in operation, but their safety verification is expected to take several years. Such issues are very common whenever a new technology is first introduced. Also, as common in all countries, the construction of disposal facilities for intermediate- and high-level radioactive waste is a challenge.



## 6. ME: Protests Grow in Iran as Nuclear Talks Stall

Sachi SAKANASHI, Senior Research Fellow  
Assistant Director, JIME Center

On September 17, in Iran, where much attention is focused on the negotiations to rebuild the nuclear deal (JCPOA), street protests erupted and quickly spread to other parts of the country. The protest was caused by the arrest of a young woman who was allegedly “wearing a head scarf improperly” and died in custody, prompting strong condemnation of the “unjustness of the authorities.” Security forces are responding in various locations, and there have been reports of deaths of both protesters and the authorities policing the protests.

Amid these circumstances, Iranian President Raisi visited New York to attend the UN General Assembly, where he met with heads of state and government, including French President Emmanuel Macron and Japanese Prime Minister Fumio Kishida, and delivered a speech at the General Debate on September 21. Prior to his visit to New York, President Raisi had announced that he had no plans to meet with U.S. negotiators, but his visit to the U.S. was accompanied by Foreign Minister Abdollahian and Vice Minister of Foreign Affairs Bagheri Kani, Iran’s lead nuclear negotiator, leading to speculation about progress of the negotiations to revive the JCPOA.

The JCPOA negotiations had remained stalled since Iran responded to the “final proposal” of the EU, saying that there was “no sufficient guarantee that the agreement will be lasting.” For Iran, President Trump’s casual scrapping of the JCPOA “at zero cost (losing nothing)” was a serious issue, and it is demanding some guarantee that the next administration, even if there is a change of government in the United States, would not simply scrap the agreement. On the other hand, in the United States, Republicans remain strongly opposed to the JCPOA, as are Israel and other U.S. allies, preventing the Biden administration from taking necessary action.

Nevertheless, reviving the JCPOA negotiations continues to attract attention because “there is no alternative.” If the JCPOA collapses, the only way to stop Iran from developing nuclear technology would be military action, which the United States does not want as it wishes to focus on Asia. Furthermore, for Iran, the collapse of the JCPOA would mean the reinstatement of UN Security Council sanctions against Iran, which would further isolate the country. This is why the international community believes that both the U.S. and Iran have the political will to revive the agreement, and therefore a “political solution” to the problem is possible. However, in response to growing protests in Iran, on September 22, the Biden administration imposed sanctions on Iran’s Morality Police officials and others for “suppressing the rights of women,” and the JCPOA negotiations were shelved once again. There is growing speculation that negotiations may not resume until after the U.S. mid-term elections, if at all.

As the Russia-Ukraine war continues, Middle Eastern countries with good relations with the U.S. are also adopting a cautious stance toward Russia, maintaining a “neutral” position. The Shanghai Cooperation Organisation (SCO) summit, held in Uzbekistan in mid-September with the participation of Russian President Vladimir Putin and Chinese President Xi Jinping, was also attended by President Erdogan of Turkey, a NATO member, sparking much attention.





## 7. Russia: President Putin Faces Difficulties but Remains Aggressive

**Shoichi ITOH**, Manager, Senior Analyst  
Global Energy Group 2, Strategy Research Unit

On September 8, Gazprom announced that Russian gas exports to the EU fell 48% year-on-year for January-August 2022. On September 15, Russian Deputy Prime Minister Novak said that the volume of exports to the EU would decrease to one-third (down approximately 50 billion m<sup>3</sup>) for the full year of 2022 compared with the previous year. On September 2, Gazprom had announced the postponement of the restart of the Nord Stream gas pipeline that supplies gas to Germany, citing “maintenance inspections” and on September 5, Kremlin Press Secretary Peskov had suggested that the pipeline may remain shut until Western economic sanctions against Russia are lifted. In the second quarter of 2022, Russia’s oil exports to China and India increased by 11 million tonnes year-on-year and payments for oil exports increased by \$9 billion year-on-year (The Financial Times, September 7). In August 2022, Russia’s LNG exports to China increased by 33.9% to 671,000 tonnes, and the value of exports rose by 164.5% to \$750 million (announced by the General Administration of Customs of China on September 20).

Russia is growing more and more economically dependent on China and has been trying to establish a close relationship with the country in international politics as well, but has been disappointed. On September 15, during the Shanghai Cooperation Organization summit in Uzbekistan, the leaders of China and Russia had their first in-person talks since Russia invaded Ukraine in February 2022. Contrary to President Putin’s wishes, President Xi Jinping did not mention Ukraine in front of the media, which forced President Putin to say that he understands China has concerns and appreciates China’s neutral stance. Not even a joint statement was issued.

On September 4, the UK Defence Ministry revealed its analysis that Russian soldiers are losing morale due to a lack of supply logistics and delays in allowance payments. On September 10, the Russian Defense Ministry withdrew Russian soldiers from the key town of Izyum in eastern Ukraine’s Kharkiv Oblast, and on the 13th, Ukrainian President Zelenskyy announced that approximately 8,000 square kilometers of territory had been liberated from Russian military occupation. Meanwhile, on September 7 and 9, city district councillors from Saint Petersburg and Moscow issued letters calling for President Putin’s resignation.

On September 21, President Putin hinted at the use of nuclear weapons in a televised speech and announced that he had signed a presidential decree for partial mobilization to call up 300,000 reservists. Part of the mobilization decree, which took effect immediately, was not disclosed, prompting rumors that it contains clauses that would allow it to mobilize one million people. On the same day, more than 1,300 people protested in 39 cities across Russia, including Moscow and Saint Petersburg, and on September 24, more than 800 people were detained by security authorities in 35 cities (according to Russian domestic NGOs). The mobilization decree has accelerated the exodus of Russians from the country.

From September 23 through 27, referendums were held in parts of the four oblasts in eastern and southern Ukraine where pro-Russian forces are based, asking the residents whether they want to join Russia. The international community, including the G7, has condemned the vote as a violation of international laws including the UN Charter and one with a “foregone conclusion,” and has made it clear that it does not recognize the outcome. There is growing concern about the possibility of Russia using tactical nuclear weapons, claiming that attacks on parts of Ukraine that Russia seeks to “annex” as attacks on its own territory.



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