WISCONSIN PROJECT
ON NUCLEAR ARMS CONTROL

IRAN WATCH

Clipping Tehran's Wings

How Supply-Side Controls Can Impede the Iranian Drone Program

IRAN WATCH ROUNDTABLE

February 2023

Introduction

The conflict in Ukraine has underscored the importance of unmanned aerial vehicles (UAVs) in modern conflict, as both Russia and Ukraine have used them effectively for surveillance and for the delivery of munitions. Iranian drones in particular have been a key instrument of Russia's devasting strikes against Ukrainian infrastructure and the country's population.

Russia's use of Iranian weapons has invigorated Western efforts to slow the further development of Iran's drone program and to limit its ability to export drones on a large scale. In December 2022, a spokeswoman for the U.S. National Security Council told the *New York Times*, "We are looking at ways to target Iranian UAV production through sanctions, export controls, and talking to private companies whose parts have been used in the production."[1]

Iran's drone development program emerged in the 1980s during the war with Iraq, when the Iranian military began using small, radio-controlled model aircraft equipped with off-the-shelf cameras to surveil developments on the front lines. Since then, Iran's drone fleet has grown and now includes several medium-size (or Predator-size) long-endurance drones that are capable of conducting reconnaissance and carrying out precision strikes, such as the Shahed-129 and Mohajer-6. Even larger, better-equipped drones such as the Fotros, Shahed-149 (Gaza), and Kaman-22 are under development.

Today, Iran's UAVs present a double challenge. First, Iran is using them in its own military operations across the Middle East. Second, Iran is exporting them abroad, including direct transfers to Russia and illicit shipments to proxy groups such as the Houthis in Yemen.

What role can sanctions and export controls play in constraining Iran's drone program, how can they be strengthened, and what limitations might they have? Further, what other tools could be brought to bear to complement these controls?

In November 2022, the Wisconsin Project on Nuclear Arms Control convened an expert panel for a private roundtable discussion about Iran's military drone development and policies to impede that development. The objective of the discussion was to explore how supply-side

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Cover image credit: Screen capture from IMA Media, "Unveiling of underground UAV and missile bases," YouTube, available at https://www.youtube.com/watch?v=uqSBa-qkdwM.

[1] David E. Sanger, Julian E. Barnes and Eric Schmitt, "U.S. Scrambles to Stop Iran From Providing Drones for Russia," New York Times, December 28, 2022, available at https://www.nytimes.com/2022/12/28/us/politics/iran-drones-russia-ukraine.html.

constraints, sanctions, and other measures have worked in the past and how they might work in the future to limit Iran's military drone development and exports.

The panel discussion was held virtually and moderated by **Valerie Lincy**, executive director of the Wisconsin Project, and **John Lauder**, former director of the U.S. intelligence community's Nonproliferation Center and now a senior fellow at the Wisconsin Project. The panelists were **Dan Gettinger**, the director of publications and communications at the Vertical Flight Society, **Taimur Khan**, head of regional operations for the Gulf region at Conflict Armament Research, **Farzin Nadimi**, associate fellow at the Washington Institute for Near East Policy, **Adam Rawnsley**, a reporter at Rolling Stone and a fellow at the Foreign Policy Research Institute, **Daniel Salisbury**, a senior research fellow at the Centre for Science and Security Studies within the Department of War Studies at Kings College London, **Richard Speier**, an independent consultant who has served in positions at the Arms Control and Disarmament Agency and the Office of the Secretary of Defense, and **Vann Van Diepen**, an independent consultant who served as principal deputy assistant secretary of state for international security and nonproliferation. John Caves and John Krzyzaniak, senior research associate and research associate at the Wisconsin Project, also participated in the discussion. Mr. Krzyzaniak prepared this report.

Finding Highlights

The panel found that Iran's drone program has been able to advance despite export controls and sanctions in part because Iran has a relatively mature and diversified drone industry comprised of government, academic, and private actors. Nonetheless, Iran's drones are believed to be less capable than those of other major drone producers, and this gap in capabilities is, in part, the result of several decades of sanctions and export controls. Supply-side controls will likely continue to limit the size and capability of Iran's drone program by increasing costs, dragging out development timelines, and impeding Iran's ability to produce high-end drones in significant numbers.

Supply-side controls also have inherent limits. In particular, the panel found that reasonably capable smaller drones can be built using widely available commercial parts. Efforts to impose more stringent controls on those parts may discourage other countries' cooperation and elicit industry pushback. The panel also agreed that China poses a particular challenge to the effectiveness of any controls, in part because Chinese distributors are a major conduit through which Western-origin parts reach Iran. Targeted U.S. sanctions on Iranian entities directly involved in drone development are a relatively new occurrence, and the United States has not yet widely used secondary sanctions to target drone component suppliers in China and elsewhere.

The panel agreed that enforcement of existing controls could be improved by focusing outreach and capacity-building efforts on the companies and governments that are sources of drone components, as well as at major distribution hubs. This could be done by dedicating more resources to coordinating with and supporting countries that are already members of multilateral export control regimes, and by engaging firms through some combination of behind-the-scenes outreach and public pressure. The ongoing use of Iranian drones in Ukraine provides an opportunity for both approaches.

The panel noted that other tools, such as the development of more cost-effective counter-drone systems, could lighten the load of what supply-side controls need to achieve. Finally, panelists cautioned that, while the war in Ukraine could galvanize Western countries to improve drone-related export controls and enforcement, it could also convince other countries that drones are an essential military investment, thus creating demand for Iran's drone exports as well as encouraging other states to initiate drone development programs.

Following are the roundtable's findings in greater detail. They are a composite of the panelists' individual views, and no finding should be attributed to any single panelist or be seen as a statement of the policy of any organization with which a panelist is affiliated.

Iran's drone industry is relatively mature and well-diversified. Through a combination of domestic production and imports, the program has advanced despite export controls and sanctions.

Iran's drone industry includes a wide range of entities. Large state-owned companies connected to the Ministry of Defense and Armed Forces Logistics, such as the Iran Aircraft Manufacturing Industries Company and Qods Aviation Industries, are the primary entities responsible for UAV design and production in Iran, and they have supplied UAVs to all branches of the Iranian armed forces for decades. Companies linked to the Islamic Revolutionary Guard Corps (IRGC) such as Shahed Aviation Industries Research Center compete with the aforementioned state-owned companies but primarily supply UAVs to the IRGC, as well as the regular navy. A growing number of smaller, private Iranian companies such as Oje Parvaz Mado Nafar Company, Fajr Aviation and Composites Industry, and Paravar Pars Company provide components or services to these larger companies. Procurement firms and individuals outside of Iran are also important to the industry, given its use of many foreign-sourced components. Finally, universities such as Imam Hussein University, Malek Ashtar University of Technology, and Sharif University of Technology undertake research and development activities and have contributed to the development of a self-sustaining knowledge base in Iran's drone industry.

Over several decades, this ecosystem has produced dozens of UAV models that can be grouped into several categories based on their function. The first category is the suicide drone, which performs as a loitering munition or small, slow cruise missile and includes the Shahed-136, the Arash, and the Ababil-T. The second category comprises drones intended primarily for surveillance, such as the Ababil-3, the Mohajer-2, and the Shahed-171. Third, there are unmanned combat aerial vehicles (UCAVs), reusable drones which conduct surveillance but can also fire munitions. These include the Mohajer-6, the Shahed-129, and the Kaman-12. Iranian drone producers are also working on even larger-bodied UCAVs such as the Kaman-22, the Shahed-149 (Gaza), and the Fotros, which will have a longer range and carry larger munitions compared to those the Iranian armed forces currently use.

Iran produces its drones domestically and regularly emphasizes their indigenous nature. However, Iranian producers also take heavy advantage of imported items, often out of necessity, according to the panel. A recent inspection of Shahed-131, Shahed-136, and Mohajer-6 models recovered in Ukraine found that 82 percent of the parts examined were produced by U.S.-based companies.[2] The components are widely commercially available, including online, and are largely used for civilian purposes; most do not appear on export control lists.

Iranian drone components that are not imported are often the product of reverse engineering. If a small number of a particular component can be imported on just one occasion, Iranian engineers can sometimes create an unlicensed copy, although such a copy may take years to perfect and may not perform as well as the original. Reverse engineering engines for smaller drones seem to have been a particular focus over the last decade. For example, the Shahed-136 is propelled by the MD-550, a four-cylinder engine that is a copy of the German Limbach L550E developed for ultralight and small general aviation airplanes and rotorcraft. Similarly, the Shahed-191 appears to use the Tolou-10 turbojet engine, a copy of the Czech PBS Velká Bíteš TJ100 developed for sport and experimental aircraft and target drones.

Several UAV designs are also the result of an explicit reverse engineering effort. Iran has obtained multiple U.S.-made models through various means. In 2011, for example, it recovered a RQ-170 Sentinel that crash-landed in Iranian territory reportedly after taking off

[2] "Dissecting Iranian drones employed by Russia in Ukraine," Conflict Armament Research, Ukraine field dispatch, November 22, available at https://storymaps.arcgis.com/stories/7a394153c87947d8a602c3927609f572.

from a U.S. military base in Afghanistan.[3] By 2014, Iran claimed to have produced a full-sized copy, which it calls the Shahed-171, as well as several smaller-scale versions. However, while the two may appear externally similar, the Shahed-171 is far less capable than its American-made counterpart, largely because Iran does not have access to the same advanced components and materials or supporting infrastructure.

Even where they cannot obtain a physical specimen, Iran's UAV designers apparently look to foreign designs for inspiration. For example, the Ababil-3 airframe closely resembles that of the Denel Dynamics Seeker produced in South Africa.

Supply-side controls will likely continue to limit the size and capability of Iran's drone program, drag out development timelines, increase costs, and impede Iran's ability to develop higher-end drones.

Iran's drone program is almost certainly less capable quantitatively and qualitatively than it would be if there were no sanctions or export controls in place. Despite four decades of effort, Iran's drone industry lags behind that of the United States, Israel, and other major producers. For example, Iran does not seem to have deployed a drone with the kind of satellite-enabled communications equipment that would allow a pilot to control it from hundreds of miles away, even though this technology has been installed on U.S. drones like the MQ-1 Predator and the MQ-9 Reaper for decades. Similarly, Iran's suicide drones still lack the high-resolution electro-optical sensors and human-in-the-loop capabilities that make other countries' loitering munitions so potent. Further, the use of Iranian drones by Russia in Ukraine has highlighted some of their mechanical and technical shortcomings, such as a reported inability to operate properly in cold weather.

Based on these assessments, the panel found that there are a handful of technological choke points where Western countries could continue to slow or prevent qualitative improvements to Iranian drones. These include satellite-enabled data links, high-resolution electro-optical or imaging infrared sensors, advanced electronic warfare countermeasures, and highly efficient jet and piston engines.

Still, Iran has demonstrated an intent to integrate many of these technologies into its drones and may be able to do so in the coming years, particularly if it receives outside help. For

[3] Scott Shane and David E. Sanger, "Drone Crash in Iran Reveals Secret U.S. Surveillance Effort," New York Times, December 7, 2011, available at https://www.nytimes.com/2011/12/08/world/middleeast/drone-crash-in-iran-reveals-secret-us-surveillance-bid.html.

example, Iran claims that its Shahed-149, a larger version of the Shahed-129 that is still under development, has a satellite-enabled data link as well as a turboprop engine. And in October the IRGC unveiled the Meraj-521 loitering munition that officials claimed had the ability to be guided by a remote operator all the way to the target. Finally, Iran claims to produce several miniature turbojet engines for use in drones and has developed a pair of small turbofan engines as well.

There are inherent limits in using supply-side controls to constrain Iran's drone program, particularly on low-end technologies.

The principal limitation of supply-side controls stems from the fact that many drones are not reliant on the direct-military-use items or even dual-use technologies that appear on control lists. That is, military drones reasonably capable of many applications can be built almost entirely using widely available commercial parts. The panel found that export controls may impede Iran's procurement of large numbers of advanced components, but they cannot realistically halt such procurement altogether. Nor can export controls prevent Iran from obtaining lower-end components in large quantities.

The Missile Technology Control Regime (MTCR) is a multilateral export control regime that aims to limit the spread of missiles and drones that could be used to deliver weapons of mass destruction. It focuses on the most sensitive missile technologies and divides them into two categories. As far as drone technologies are concerned, Category I includes complete UAVs with the ability to fly at least 300 km and carry a payload of at least 500 kg. Category II items include some advanced UAV components, such as certain turbojet and turbofan engines and complete UAVs capable of flying at least 300 km with any payload. The MTCR is a voluntary initiative with only 35 member countries (plus a score of others that apply MTCR controls unilaterally), but the panel emphasized that the vast majority of components used in Iranian drones remain below the control thresholds created by the MTCR.

The Wassenaar Arrangement, another multilateral export control regime, also has a limited ability to stop exports that would advance Iran's drone program. With a broader membership of 42 countries, the group aims to promote transparency in transfers of conventional arms and related dual-use goods. However, its rules allow substantial national discretion in permitting exports. Further, as with the MTCR, many drone parts used by Iran fall below the threshold of inclusion on the Wassenaar Arrangement's dual-use list.

Further, Russia is a member of both the MTCR and the Wassenaar Arrangement; this could limit the scope of any future change in drone-related controls, which must be adopted by

consensus. As its relations with the West continue to deteriorate, Russia may be less likely to fully abide by its regime commitments and more likely to block any potential reforms.

Both the Wassenaar Arrangement and the MTCR include provisions for "catch-all" controls, which do not rely on a specific list of items; rather, they are aimed at controlling the flow of unlisted items when there is reason to believe those are intended for a proliferation-sensitive or military end use. The United States and many other governments have national catch-all controls, which are considered part of a robust export control system.

Given the high percentage of unlisted Western-origin items found in Iranian drones used in Ukraine, the panel found that the implementation of catch-all controls offers the best chance of preventing drone-related goods and technology from flowing to Iran. With such controls in place, a government has the legal basis to take direct action based on its own investigation or in response to intelligence shared by a partner government.

However, not all countries have enacted such controls, and therefore may lack a national legal basis for a license denial, interdiction, or some other blocking action related to Iranian drone procurement. United Nations Security Council resolution 2231 does include a narrow restriction on Iran's exports and imports of certain types of drones, and France, the United Kingdom, and the United States have claimed that Iran's transfers to Russia were a violation of this restriction.[4] This restriction will expire in October 2023, however, and the expiration in October 2020, of the blanket restriction on arms-related trade with Iran ended a broader international legal basis that could be used to motivate governments without national catch-all controls to take such action.

The panel also raised concerns about industry resistance to greater controls on drone-related technology, particularly among sectors that are new to trade restrictions. Such controls may raise compliance costs and slow or impede sales of items that have a range of non-drone applications. For instance, the Austrian company BRP-Rotax produces the engines used in Iran's Shahed-129 and Mohajer-6, but it is better known for its snowmobile and watercraft engines. Snowmobile dealers that are authorized distributors of Rotax products likely have little experience controlling trade because of a concern for military end use. Similarly, the hobbyist community may also resist stricter controls on parts that are common for recreational drone use.

[4] Humeyra Pamuk and Arshad Mohammed, "U.S. says Iran supplying drones to Russia violates U.N. resolution," *Reuters*, October 18, 2022, available at https://www.reuters.com/world/us-says-iran-supplying-drones-russia-violates-un-resolution-2022-10-17/.

The nature of the international supply chain may pose a challenge even where states and companies are willing to scrutinize exports more closely. For example, in the electronics industry, there are perhaps hundreds of billions of electronic chips already in circulation throughout the world. Texas Instruments alone produces tens of billions of semiconductors every year across 80,000 different products. Further, chip manufacturers mostly sell their products to large distributors rather than selling directly to the end user. A distributor, in turn, may stock 100,000 different components, each with dozens or hundreds of possible civil applications. A product may change hands several times before reaching the end user.

Broad U.S. economic sanctions have been effective insofar as they have deprived Iran's defense industry of resources. Targeted sanctions on entities connected to Iran's drone development are relatively new and could be expanded.

Broad sanctions targeting various sectors of the Iranian economy have existed for decades and have intensified since the U.S. withdrawal from the Joint Comprehensive Plan of Action (JCPOA) in 2018. Most notable are the sanctions targeting Iran's oil, shipping, and banking industries, which have depressed the economy and depleted Iranian government funds. The panel found that these general sanctions have had a meaningful impact in constraining the drone program—albeit indirectly by limiting Iran's overall investment in defense programs. According to the U.S. Defense Intelligence Agency, Iranian defense spending peaked in 2012 at around 27 billion dollars, but fell sharply while Iran was heavily sanctioned over the following years until the nuclear deal was agreed in 2015. A similar patten appears to have played out in the years after 2018.[5]

The panel agreed that the few sanctions that have targeted specific Iranian drone-related entities have been less effective, but also noted that most have not been in place for very long. For example, the first U.S. sanctions announcement explicitly targeting Iran's UAV program came in October 2021. This announcement targeted Oje Parvaz Mado Nafar Company, which produces small combustion engines. There is no public evidence that the designation has hindered the company's operations. Similarly, the United States sanctioned

[5] "Iran Military Power: Ensuring Regime Survival and Securing Regional Dominance," Defense Intelligence Agency, November 19, 2019, p. 18, available at https://www.dia.mil/Portals/110/Images/News/Military_Powers_Publications/Iran_Military_Power_LR.pdf; Henry Rome, "Iran's Defense Spending," The Iran Primer, June 17, 2020, available at https://iranprimer.usip.org/blog/2020/jun/17/iran%E2%80%99s-defense-spending.

Shahed Aviation Industries, which has been developing drones for some two decades, only in September 2022 in connection with Iranian drone transfers to Russia. U.S. drone-related sanctions have been primarily imposed pursuant to Executive Order 13382, which targets the proliferation of weapons of mass destruction and their delivery systems by freezing proliferators' assets under U.S. jurisdiction and prohibiting transactions with U.S. parties, and by authorizing similar sanctions against foreign entities doing business with the sanctioned ones. Targeted European Union sanctions on Iranian drone-related entities are even newer and have narrowly focused on transfers to Russia, using Council Regulation (EU) No. 269/2014.

The United States could continue to target Iranian companies involved in the production of drones that have not yet been sanctioned. Examples here include Fajr Aviation & Composite Industries, a subsidiary of the Iran Aviation Industries Organization that is sanctioned by the European Union but not the United States, or Mahtabal (Mahta Wing), which claims to be an authorized distributor of Austrian-origin Rotax engines in Iran. As noted above, Rotax-brand engines are used in Iran's Mohajer-6 and Shahed-129 drones.

Additionally, U.S. sanctions designations of companies in third countries may be effective, according to the panel, both in slowing the supply to Iran's drone program and deterring additional companies from trade that might support that program. This would require greater intelligence collection on Iranian drone development and procurement as well as a willingness on the part of the United States to use more of that intelligence in order to support diplomatic overtures, interdiction actions, and sanctions. The United States must be prepared to "break eggs" in bilateral relationships by pressing countries to prioritize actions to impede Iranian drone-related procurement.

In addition to sanctioning companies supplying Iran, the United States could target proliferators' money using civil asset forfeiture. Correspondent banking arrangements can allow U.S. law enforcement to seize funds from overseas banks hosting proliferators' accounts that are disconnected from the U.S. financial system.

China presents a challenge for any export control aimed at restraining Iran's drone program.

The panel found that China poses a major challenge to supply-side controls in three distinct ways. First, China, including Hong Kong, is a diversion and transshipment point for Western origin goods, making it easier for Iran to obtain them (for example from Chinese distributors and Iranian front companies). An effort by the United Nations to trace the chain of custody for various Iranian weapons used by Yemen's Houthi rebels revealed that engines, inertial

navigation sensors, servo motors, and various other components were manufactured in the West but routed through Chinese territory.[6]

Second, Chinese entities serve as suppliers of Chinese-made drone components to Iran. For example, a Mohajer-6 drone recovered in Ukraine contained a miniature real-time camera produced by the Hong Kong-based RunCam Technology, as well as a thermal imaging camera that may have been made by Qingdao Thundsea Marine Technology. This mirrors a pattern seen in the past in missile development, with China sharing, for example, infrared guidance for heat-seeking missiles.

Third, Chinese companies also appear to be increasingly willing to engage in joint ventures with Iranian nationals, enabling the latter to gain access to the technologies, manufacturing capacity, and markets necessary for producing and co-marketing components themselves.

The Chinese government has historically devoted comparably few resources and low priority to enforcing export controls related to weapons of mass destruction and missile proliferation and is even less likely to devote resources to controlling drone components that do not meet the threshold of export control regimes. If Iran is prepared to devote hard currency to drone development, Chinese entities provide a ready avenue of supply.

Still, the panel noted that certain individual Chinese companies, particularly those that have an economic interest in continuing to trade with the West, may be willing to reduce or more closely monitor their business with Iran in order to protect their reputations and avoid secondary sanctions.

Compliance with existing controls could be improved by increasing resources devoted to capacity-building and outreach to public and private sectors in countries that are a source of drone components.

The panel concluded that the United States and its partners have several options to ramp up existing supply-side controls. For example, where the United States and its allies train foreign customs, licensing, and enforcement officials to implement catch-all controls, these trainings could place a greater emphasis on identifying drone-related technologies and entities.

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[6] "Letter dated 22 January 2021 from the Panel of Experts on Yemen addressed to the President of the Security Council," U.N. Security Council, S/2021/79, Annex 19, pp. 165-166, available at https://www.undocs.org/S/2021/79, accessed on January 19, 2023.

Further, the United States could expand export control assistance to members of multilateral export control regimes whose markets are likely to be exploited by Iran for drone technology. This type of "in-reach" entails additional bureaucratic hurdles, such as congressional waivers of legal requirements that assistance be focused on low-income countries, but the closer coordination it brings could help stem the flow of Western-origin drone technologies to Iran.

Alongside capacity building, governments must be willing to pressure and if necessary punish companies in their jurisdiction whose products have ended up in Iranian drones and that fail to improve due diligence on their clients and their supply chain.

Non-governmental organizations and the media could play a role in a public pressure campaign aimed at such companies. For example, the open-source information being gathered by non-governmental organizations examining the wreckage of Iranian drones in Ukraine can be used publicly to support such pressure. "Naming and shaming" could be effective in persuading some companies to devote additional resources to identifying suspect inquiries and refraining from risky transactions. However, some members of the panel cautioned that public shaming could also backfire, particularly if it alienates companies with limited resources to devote to compliance. In some cases, it may be more productive to engage with companies behind closed doors, at least initially.

There are other tools that could mitigate the impact of Iranian drones and lighten the load of what supply-side controls need to achieve.

While supply-side controls can continue to be effective to some extent, they are limited in what they can achieve going forward. The panel found that in order for export controls and sanctions to be most effective, they should be paired with other tools in the counter-proliferation toolkit, including prosecutions, interdictions, pressure against suppliers, and, especially, active and passive defenses.

Currently, active defense options against drones are not cost effective. It costs vastly more to defend against Iranian drones using, for example, air defense missiles, than the cost of the drone itself. Greater investment in more cost-effective counter-drone technologies, like electronic warfare and radiofrequency weapons, by Western governments would better complement supply-side controls that are more effective against high-end components for advanced drones.

Other tools available to Western governments include interdictions of smuggled drone components and law enforcement actions that target suppliers, such as prosecutions of sanctions-evaders in U.S. courts and the use of civil asset forfeiture. Combined with export

controls and sanctions, these measures can help delay or prevent Iran's acquisition of key components, complicate Iran's procurement efforts, and further raise program costs by deterring potential suppliers. But the panel cautioned that some of these measures could be controversial because of their extraterritorial nature, sparking disagreements over the extent of U.S. jurisdiction.

Finally, covert operations targeting Iranian production capacity, such as cyberattacks, physical sabotage against key factories, or the insertion of faulty components into the supply chain, could also hamper Iran's drone program. These setbacks would be temporary unless there was a sustained campaign of such operations.

The war in Ukraine presents opportunities and challenges for constraining Iran's drone capabilities.

The panel found that the war—and the demonstrated utility of drones in the conflict—has increased both interest in export controls and sanctions and demand for drone capabilities among more countries. For example, in the fall of 2022, an Iranian defense official boasted that some 22 countries had already sought to acquire Iranian drones.[7] Such rising demand would necessarily complicate Western efforts to limit the Iranian drone program.

At the same time, Western countries are learning more about Iranian drones and their components from wreckage recovered in Ukraine. These investigations can inform Western governments' targeted efforts to cut off the flow of parts to Iran. For example, by identifying a specific component and finding its serial number, it may be possible to trace the item's chain of custody from the manufacturer to the end user. Establishing chains of custody can help government authorities better understand how Iranian procurement and supply networks operate, allowing them to take steps to impede those networks. Further, manufacturers and distributors may adjust their own due diligence practices based on this information.

Additionally, the use of Iranian drones in Ukraine has galvanized greater political support for further strengthening export controls and imposing more sanctions. This is particularly true among European countries, which have a clear and direct interest in preventing Iranian drone proliferation to Russia, have domestic catch-all controls in place, and have the resources to implement them stringently. More generally, the war may prompt Western countries to

[7] "22 Countries Vying for Iranian Drones: General," *Tasnim News Agency*, October 18, 2022, available at https://www.tasnimnews.com/en/news/2022/10/18/2789893/22-countries-vying-for-iranian-drones-general.

improve current coordination on export control and enforcement policies presently aimed at restricting Russia's access to advanced technology. Such coordination could be broadened to restrict technology to additional adversaries, including Iran.

The Panel Included:

- **Dan Gettinger**, the director of publications and communications at the Vertical Flight Society
- **Taimur Khan**, head of regional operations for the Gulf region at Conflict Armament Research
- **John Lauder**, former director of the U.S. intelligence community's Nonproliferation Center and senior fellow at the Wisconsin Project
- **Valerie Lincy**, executive director of the Wisconsin Project on Nuclear Arms Control
- **Farzin Nadimi**, associate fellow at the Washington Institute for Near East Policy
- **Adam Rawnsley**, reporter at Rolling Stone and a fellow at the Foreign Policy Research Institute
- **Daniel Salisbury**, senior research fellow at the Centre for Science and Security Studies within the Department of War Studies at Kings College London
- **Richard Speier**, independent consultant who has served in positions at the Arms Control and Disarmament Agency and the Office of the Secretary of Defense
- **Vann Van Diepen**, independent consultant who served as principal deputy assistant secretary of state for international security and nonproliferation

About the Wisconsin Project

The Wisconsin Project on Nuclear Arms Control is a non-profit, non-partisan organization based in Washington D.C. that conducts research, advocacy, and public education designed to inhibit the spread of nuclear, chemical, and biological weapons and the missiles to deliver them. The organization was founded in 1986 by Gary Milhollin, in cooperation with the University of Wisconsin.

The Wisconsin Project's mission is to reduce the risk that exports will accelerate the proliferation of weapons of mass destruction. The Project helps governments comply with the export restrictions in international agreements, and helps them ensure that their national controls on strategic goods are enforced. The Project also publicizes clandestine transactions in these goods, and draws attention to weaknesses in trade agreements and national laws. Through its research, testimony, and publications, the Project has influenced the export policies of major supplier countries.

About Iran Watch

Iran Watch is a website published by the Wisconsin Project that monitors Iran's capability for building nuclear weapons and long-range missiles. The purpose of the website is to increase public awareness of the strategic situation in Iran and to make detailed knowledge of Iran's weapon potential available to policymakers, the media, private scholars, and the general public.

Through Iran Watch, the Wisconsin Project provides an objective resource for monitoring and assessing the implementation of the nuclear agreement, or Joint Comprehensive Plan of Action (JCPOA). The site contains thousands of primary source documents related to Iran, as well as reports on Iran's nuclear and missile programs, profiles of the entities involved in or supporting these programs, and analysis of the international effort halt them.