

*JINSA's Gemunder Center for Defense and Strategy*

## **Implications of Iran's Enrichment to 20 Percent**

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*Iran's announcement that it has begun enriching uranium to 20 percent represents its gravest nuclear escalation in years and a shift in its counterpressure strategy against the United States. This policy memo from JINSA staff lays out the implications of Iran's move and provides policy recommendations for U.S. officials.*

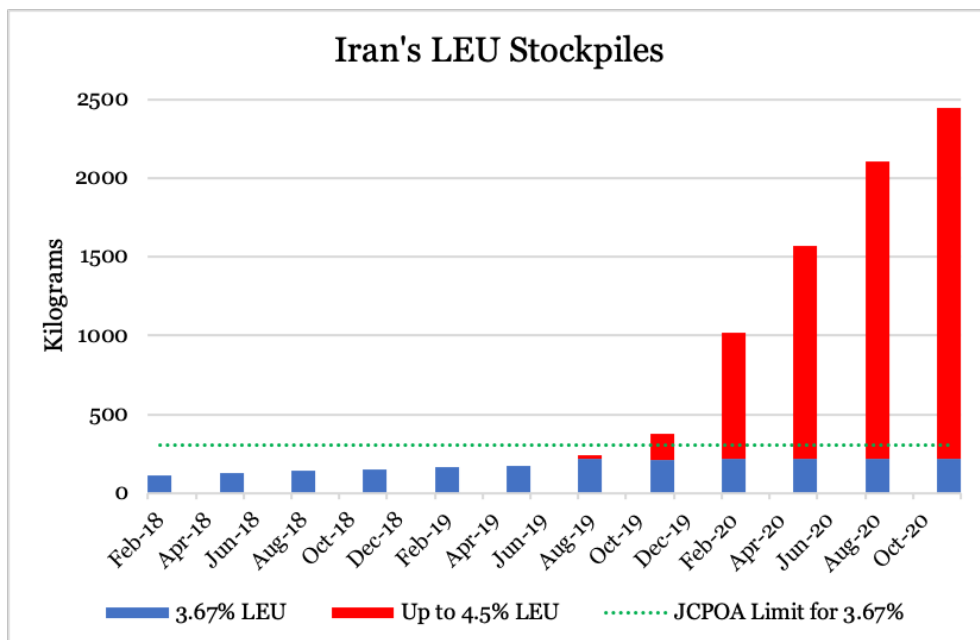
### Key Takeaways

- Iran declared it would resume producing 20 percent low enriched uranium (LEU) at its deeply buried, formerly covert Fordo nuclear facility, coinciding with the one-year anniversary of the U.S. killing of Iranian Gen. Qassem Soleimani.
- Though Iran has progressively escalated its violations of the Joint Comprehensive Plan of Action (JCPOA) since President Trump withdrew from it in May 2018, this latest move represents the biggest nuclear escalation by Tehran in a decade.
- Iran's breakout window will shrink quickly as its 20 percent LEU stockpile grows, dwindling from around four months to potentially as little as two months by mid-2021.
  - This could change the behavior of critical players such as the United States, Europe, and Israel and decide whether Iran gains a nuclear weapons capability, forces major international concessions, or miscalculates and galvanizes action to stop its nuclear program.
- The move to 20 percent enrichment also marks a major but subtle shift in Iran's counterpressure strategy.
  - Since May 2019, Iran has undertaken concerted regional aggression but limited nuclear escalation.
  - Now Iran has inverted the ratio between the two elements of its counterpressure: eschewing military retaliation, as the U.S. expected, on the Soleimani anniversary and instead opting for significant nuclear escalation.

- This suggests Iran has shifted from focusing on pushing the Trump administration back into the JCPOA, to now building diplomatic leverage for expected negotiations with the incoming Biden administration.
- The incoming Biden Administration must pursue a robust, truly “maximum pressure” strategy combining strong sanctions enforcement with credible preparations for military options to deter further Iranian aggression and nuclear escalation.

## Context: Iran’s Escalations

- December 31, 2020: on the eve of the one-year anniversary of the U.S. killing of Iranian Gen. Qassem Soleimani, Iran informed the International Atomic Energy Agency (IAEA) of its intention to begin [producing](#) 20 percent low enriched uranium (LEU), though at the time it specified no start date.
- January 4, 2021: Iran’s Foreign Minister Javad Zarif [tweets](#) that Iran has begun enrichment to 20 percent LEU.
- These latest moves are part of Iran’s two-track counterpressure strategy with both nuclear and regional components:
  - On the regional front, Iran and its proxies conducted attacks on energy infrastructure and U.S. bases and personnel around the Persian Gulf and Arabian Peninsula;
  - On the nuclear front, Iran progressively escalated its nuclear program beyond JCPOA limits, including by exceeding the deal’s cap for LEU at 3.67 percent and the 300kg limit for this stockpile, as well as by resuming enrichment at Fordo.

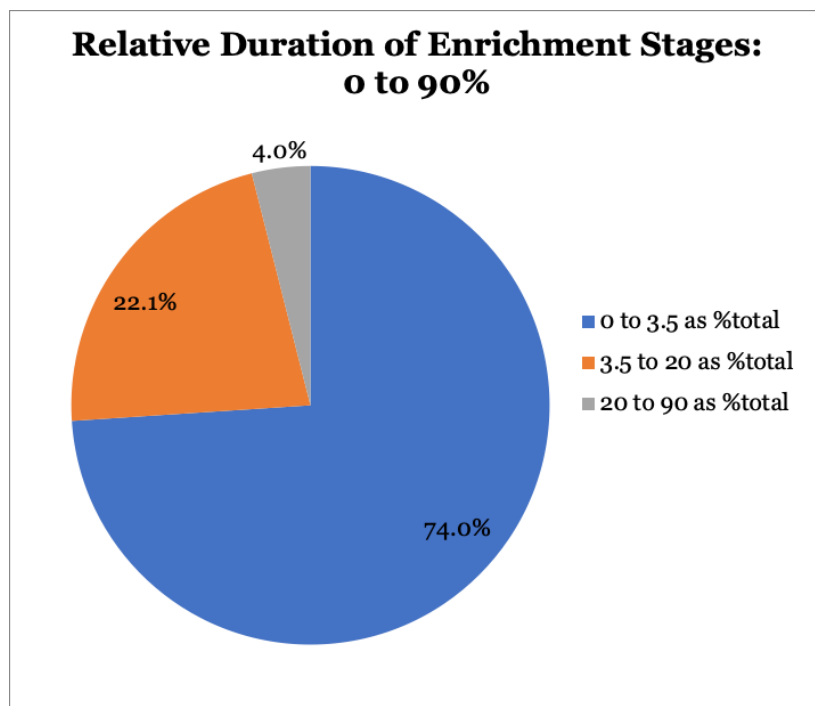


- These latest moves also come, however, against the backdrop of the inauguration, on January 20, 2021, of President-elect Joe Biden, who has promised to lift sanctions on Iran if it returns to JCPOA compliance as well as [signaling](#) his interest in negotiations to further restrict Iranian behavior.
  - By choosing nuclear escalation over military retaliation on the anniversary of the Soleimani strike, [Iran appears to be tailoring its strategy to build maximum diplomatic leverage ahead of expected negotiations with the Biden Administration.](#)
  - Rather than launching attacks that could result in U.S. fatalities or the downing of a civilian airliner, as it did last year, which could risk foreclosing the option of talks, Iran has opted for a form of pressure that brought it success in the last round of negotiations with the United States: speeding up its nuclear clock.
  - By expanding its nuclear program, Iran is trying to increase the number of concessions it can demand from the United States just to return to the JCPOA. [This nuclear blackmail strategy aims both to maximally enrich the Tehran regime and rob the United States of any leverage it might have to demand Iran do more than just go back to the JCPOA,](#) such as concessions over its ballistic missile program.

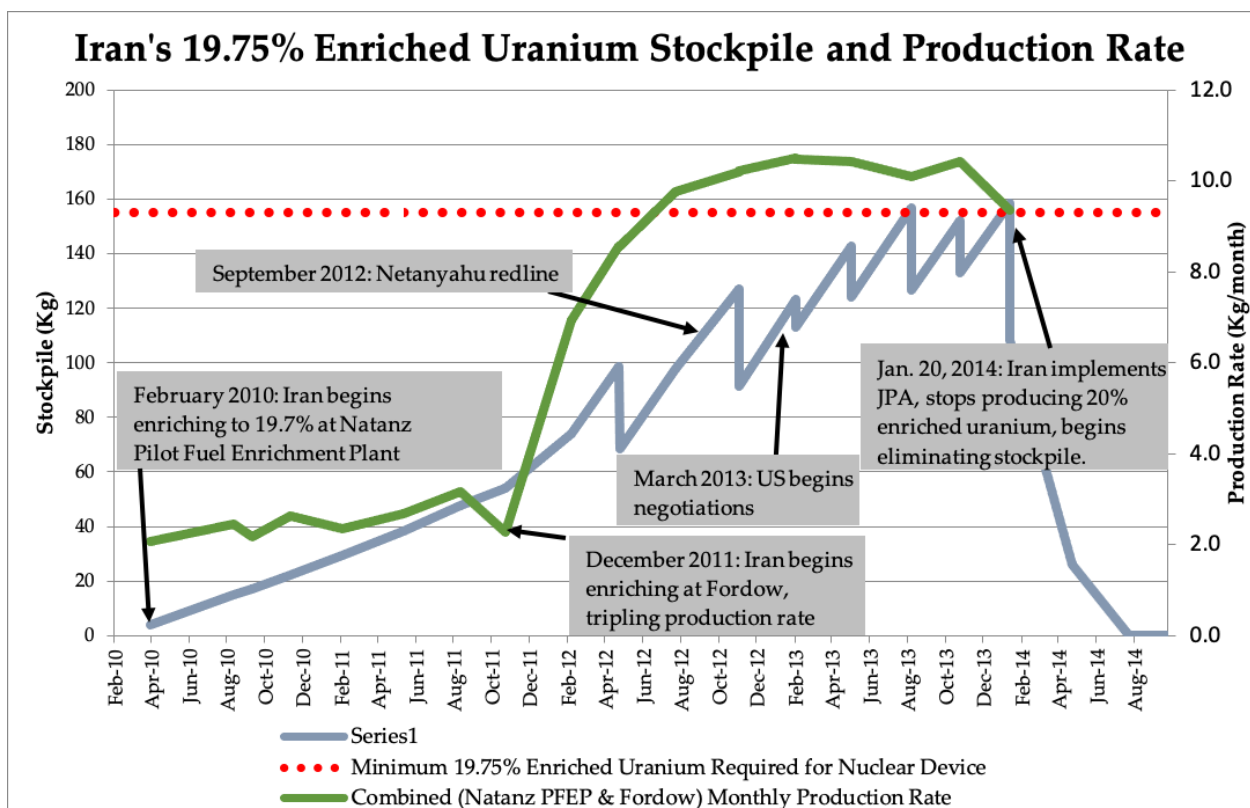
## Background: Iran’s Production of 20 Percent LEU

- [Enriching uranium to 20 percent entails roughly nine-tenths of the work needed to produce fissile material for a nuclear weapon.](#) Thus, despite already having taken multiple steps to violate the JCPOA, enriching to 20 percent LEU represents the biggest nuclear escalation by Iran in years.

- The fissile material required for a single nuclear device is a minimum of 20 kilograms of uranium enriched above 90 percent (also known as highly enriched uranium, or HEU).
- To produce 20kg of HEU, Iran needs at least [1,845kg of 4.5 percent LEU](#) or 260kg of 20 percent LEU, depending on the enrichment process it uses.

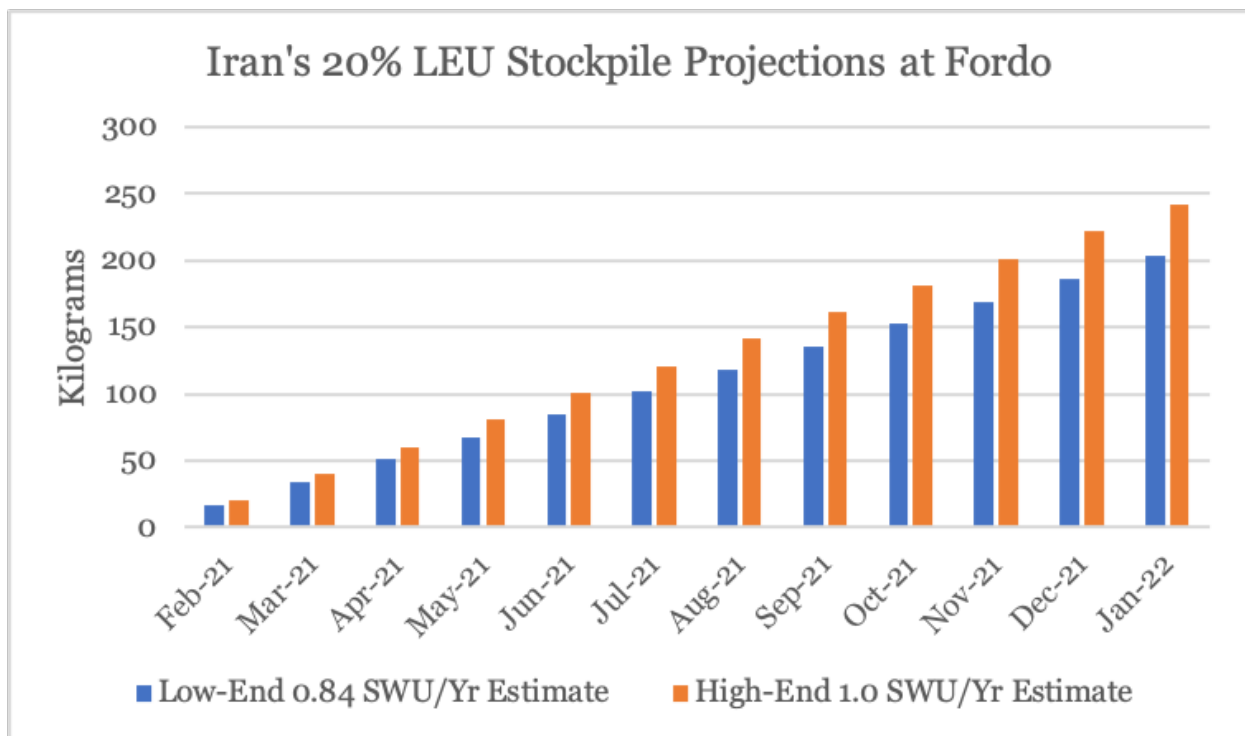


- Iran has begun production of 20 percent LEU at the underground and fortified Fordo Fuel Enrichment Plant (FFEP).
  - Enrichment to 20 percent is taking place using all 1,044 IR-1 centrifuges currently installed at FFEP.
  - FFEP was built covertly, in violation of Iran's safeguards agreement with the IAEA; Tehran acknowledged the facility's existence in 2009 only after Western intelligence agencies revealed they had discovered it.
  - Combined, the facility's small size, placement deep underground and location at a military site all suggest it is designed to produce fuel for nuclear weapons rather than for civilian power plants.



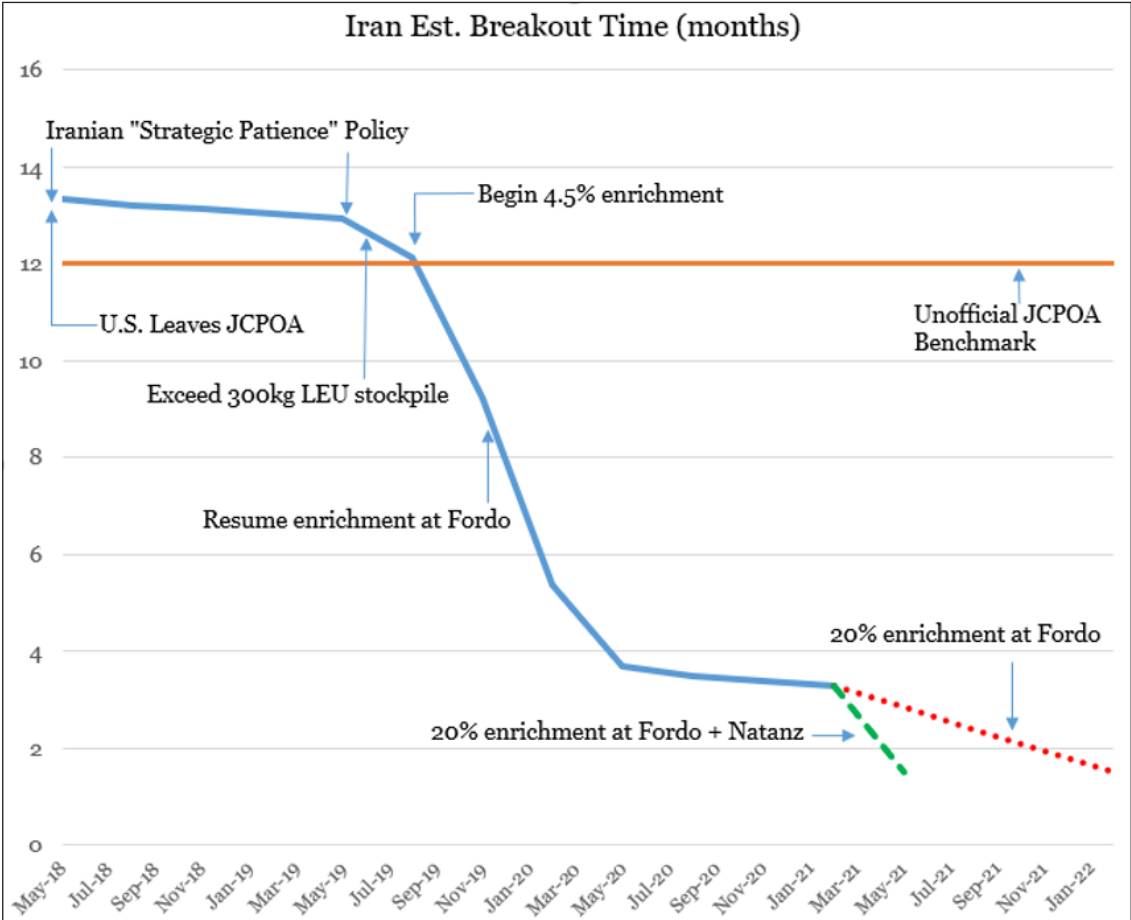
- Because of how dangerously close it came to a nuclear weapons capability, Iran's previous enrichment to 20 percent was a major catalytic event.
  - Iran previously enriched to 20 percent LEU from 2010 until the 2014 preliminary Joint Plan of Action. It began production of 20 percent LEU at the Natanz Pilot Fuel Enrichment Plant and then expanded it to the FFEP in 2012.
  - Iran's stockpile of 20 percent LEU reached a maximum of 125kg in May 2013, prompting Israeli Prime Minister Netanyahu to publicly declare as a [redline](#) the accumulation by Iran of one bomb's worth of LEU at this level and lending urgency to U.S. attempts to negotiate a nuclear deal with Iran—leading to the JCPOA.

- However, Iran precisely modulated the size of its 20 percent LEU stockpile between 2013 and 2014 to exert just enough pressure to get a favorable deal from the United States without precipitating an Israeli military strike. It will likely try to play the same game again.
- Depending on how quickly and how large Iran's stockpile of 20 percent LEU grows, this move could once again become the determinative event in deciding the future of Iran's nuclear program.
  - This major escalation could help convince the Biden Administration and European nations, which have thus far supported the JCPOA, of Iranian intransigence and build support for new, multilateral sanctions.
    - On January 4 the European Union [warned](#) any move to enrich 20 percent LEU would be a "considerable departure" from the JCPOA.
  - Alternatively, Iran's approaching nuclear breakout could, as it did in 2014 and 2015, convince the United States and its partners to make generous concessions in order to more quickly secure a deal.
  - A third option might be that Iran miscalculates either U.S. and Israeli redlines. In response to Iran's January 4 announcement, Netanyahu [said](#) this "cannot be explained in any way other than the continuation of realizing its goal to develop a military nuclear program. Israel will not allow Iran to manufacture a nuclear weapon."



# Implications for Iran's Nuclear Progress

- According to [JINSA](#), currently Iran's "breakout time" to produce one nuclear weapon's worth of fissile material is an estimated 3-4 months, down from 12+ months under the JCPOA.
  - This is the combined result of Iran's previous violations of JCPOA limits, including enriching up to 4.5 percent LEU (above the 3.67 percent LEU limit), exceeding 300 kilograms of stockpiled LEU and resuming enrichment at Fordo.
- Iran's breakout window will shrink quickly as its 20 percent LEU stockpile grows.



- According to JINSA's calculations, the effect on Iran's breakout time depends on several factors:
  - Using only FFEP, Iran would need perhaps one year to produce one bomb's worth of 20 percent LEU.
  - If Iran also used the current operating centrifuges at its larger Natanz enrichment facility, it would need only an estimated 2-3 months to produce one bomb's worth of 20 percent LEU.

- This estimate would drop even further if Iran also used any of its more advanced IR-2m, IR-4 and/or IR-6 centrifuges to produce 20 percent LEU.
- Either way, once Iran stockpiles enough 20 percent LEU, at least 260kg, it would only need an additional [six weeks](#) or so to convert it into weapons-grade uranium.
- Once Iran's breakout window drops below two months, it may exceed the ability of the United States and its partners to detect and stop an Iranian sprint for nuclear weapons capability.

## Implications for U.S. Policy

- Iran's latest nuclear escalation, and accompanying seizure of the South Korean tanker in the Persian Gulf, should be seen in light of its existing dual-track counterpressure strategy against the United States.
  - As with all its previous nuclear escalations, Iran emphasized how this latest move is fully [reversible](#) once U.S. sanctions pressure is lifted.
- Enrichment to 20 percent LEU is a bold gambit to bolster Iranian negotiating leverage against the United States, amid expectations that Washington and Tehran will return to nuclear diplomacy under the incoming Biden Administration.
  - As the above breakout estimates suggest, Iran's latest nuclear move will enable it to exert steadily greater pressure on its American counterparts over time as it approaches the threshold of enough 20 percent LEU for one nuclear weapon.
  - At the same time, the move does not suggest an immediate dash for the bomb, thus mitigating at least to some extent the risk of preemptive military action by the United States and/or Israel against Iran's nuclear facilities.
- As a recent JINSA report [lays out](#), simply returning to the JCPOA is untenable given its myriad flaws and the sheer amount of existing leverage the United States would needlessly sacrifice by rejoining the agreement.
- Instead, as Iran continues trying to turn the screws on the United States and our allies, Washington must pursue a more robust, truly "maximum pressure" strategy combining strong existing sanctions enforcement with credible preparations for military options if it hopes to deter or prevent further Iranian aggression and nuclear escalation. Preparations should include:
  - Updating Pentagon contingency planning to neutralize Iran's nuclear facilities, counter potential retaliation by Iran and/or its proxies and defend the United States and its allies from Iranian precision missiles and drones;
  - Ensuring that the rules of engagement for its forces around the Middle East, both onshore and off, permit appropriately forceful self-defense responses to potential escalation by Iran and its proxies;

- Guaranteeing that Israel, which has been at the forefront of rolling back Iran's nuclear and regional expansions, has the tools to continue defending both itself and U.S. interests;
- Working with U.S. regional allies to develop stronger and more interoperable air, maritime and cyber defenses, as well as improved intelligence-sharing;
- Conducting highly-visible joint and international military exercises to make U.S. and allied capabilities and unity abundantly clear to Iran.

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