Is Iran on the brink of collapse?

written by Elie Klutstein | 21.11.2024

When people think of Iran, the image of a vast desert nation, filled with endless stretches of sand and intense heat, often comes to mind. But in reality, that is not the case. Tehran, for example, is located at an elevation of over 900 meters, with some areas reaching as high as 1,800 meters, situated at the foot of a high mountain range. In winter, snow often falls there, and the cold strikes harshly.

Therefore, authorities in the country have already begun preparing for the freezing winter, trying to conserve vital energy resources for heating, transportation, and other needs. As a result, Tehran recently began implementing planned daily two-hour electricity outages. In a city of about 9.5 million residents—nearly the same as the entire population of Israel—this is no small decree. However, Tehran can count itself lucky: in other parts of the country, power outages last for a third of the day, about eight hours daily. This situation naturally impacts many sectors in Iran, harming industries, commerce, sanitation, and more.

A energy giant in crisis

This phenomenon is particularly surprising, given that Iran is one of the largest energy powers in the world. Only two countries hold larger oil reserves than the Islamic Republic—Venezuela and Saudi Arabia. Additionally, Tehran boasts the second-largest natural gas reserves in the world. More troubling is that the energy crisis in Iran is so severe, and the demand is only growing, that the Islamic Republic is forced to import gas from Russia to meet its citizens' needs even during times without planned outages. In July, the government in Tehran reached an agreement with its northern neighbor, Turkmenistan, on another deal to increase gas imports from Ashgabat, in an attempt to open an additional channel of gas supply.

Incidentally, even in the summer, the capital's residents suffered from widespread power outages. When the heat rises and residents turn on air conditioners, the electricity grid cannot meet the demand—and collapses. Last summer, for instance, Tehran's temperatures neared 40°C, which naturally increased the demand for air conditioning. In July, as a result of the extreme heat and power

outages, authorities decided to reduce working hours in public institutions, partly to prevent deaths from dehydration and heatstroke.

Given these difficulties, it is no wonder that Iranian citizens feel harmed. Some have even dared to complain anonymously to media outlets affiliated with the opposition abroad. One of them, for example, noted, “The officials speak of war against Iran, yet they squandered Iranian resources by funneling funds to groups like Hamas and Hezbollah, leaving the entire nation to suffer the consequences.” Another resident added, “For years, you waged a global war over nuclear energy, but you can’t even guarantee stable electricity for the entire country.”

Even in Bushehr, the city home to the country’s nuclear power plant—nuclear power plants being considered particularly efficient for electricity production—residents suffer from power outages. One resident described the situation during the summer months: “It’s not just the heat; it’s the unbearable summer humidity,” he said. “This August, the heat was so intense that if you went outside in sandals, as many do in southern Iran, the skin on your feet would get burned.” During the same period, Bushehr residents faced another blow: the extreme heat forced authorities to ration water supplies in addition to electricity.

According to opposition reports, the electricity crisis remained unresolved during the summer, leading to protests in many cities across the country, including Tehran. Merchants in the capital took to the streets and blocked roads in protest of the government’s failure.

This crisis has wide-ranging impacts across various sectors: for example, agriculture suffers greatly because farmers cannot pump water from wells due to the lack of electricity, alongside crop damage caused by the extreme heat. Electrical appliances break due to sudden power outages, traffic jams form in cities where traffic lights stop working, and industrial factories report significant economic damage. Many people find themselves trapped in elevators due to unannounced outages. If the situation continues, it is expected to affect even heavy industries such as the steel industry. Overall, estimates suggest that power outages alone could cost the Iranian economy between $5 billion and $8 billion annually.

Why continue exports amid shortages?

Why does this happen? How can a country with so much oil and gas be forced to conserve energy for winter and fail to supply electricity to its citizens—a basic modern commodity?

The electricity shortage in Iran during the summer was so severe, for example, that it required twice the amount of electricity produced by neighboring Azerbaijan to meet the needs of the Persian giant's residents. This is no trivial figure: Azerbaijan exports about 10% of its electricity production to Russia, Georgia, Iran, and Turkey in deals collectively valued at over $400 million. Based on this calculation, experts noted, the cost of producing enough electricity for Iran's entire population during the summer alone could reach $8 billion.

The gap between electricity demand and supply is currently about 20%, according to some estimates. This is partly due to the burden in a country of nearly 90 million people, which has suffered from years of neglect and insufficient electricity infrastructure. The nuclear power plant in Bushehr can supply, according to one estimate, only 1% of Iran's electricity demand—far from sufficient to meet the needs of the entire nation.

Root causes of the crisis

The root of the problem lies in several factors. The government has failed to invest adequately in electricity infrastructure for many years, has not built advanced power plants in recent decades, and the electricity grid is outdated. Rising oil prices have disrupted the balance that previously existed between supply and demand. Authorities have neglected maintenance of the crumbling electricity grid, which continues to deteriorate—leading to summer blackouts.

In winter, additional factors worsen the crisis: the government is trying to reduce its reliance on mazut, a low-quality and highly polluting byproduct of oil refining. Experts explained that fueling three power plants in the country with mazut posed health risks and caused air pollution, prompting the government to halt its use. As a result, and due to the government's decision not to use diesel in the power plants of Arak, Isfahan, and Karaj, Iran is forced to provide less electricity to its citizens.

Iran's infrastructure is so outdated and inefficient that a significant portion of its electricity generation potential is lost and unused. For example, 13% of the electricity produced in the country is lost during transmission from power plants to the national grid and from there to homes. In addition, Iran's thermal power plants, which produce over 90% of the country's electricity, are fueled by natural gas. Gas usage in Iran is inefficient, and the country already lacks enough gas to fuel these plants—one reason it is seeking additional sources for gas imports. Experts predict that this winter, Iran will face a gas shortage of 260 million cubic meters per day.

Moreover, Iran faces high demand for transportation fuel, which depletes the country's oil reserves. However, fuel refining for vehicles in Iran is of very poor quality, serving old and inefficient vehicles that do not make optimal use of the fuel. Public transportation infrastructure in the country is underdeveloped, forcing most citizens to rely on private vehicles. This reliance is further encouraged by Iran's extremely low fuel prices, among the cheapest in the world, at about 2 cents per liter. Recently, President Masoud Pezeshkian publicly questioned the government's need to subsidize fuel. This sparked rumors of a potential price increase, which has certainly not helped public morale. In 2019, fuel price hikes led to riots in which hundreds were reported killed or even more.

Perplexing energy exports

Against this backdrop, it is particularly puzzling that Iran continues to export gas and electricity to countries like Iraq, Pakistan, and Afghanistan. The amount of electricity it exports is not very large, estimated by experts to be equivalent to about 1% of its total production. However, when citizens are suffering such severe shortages, why is any electricity being exported at all?

There are several reasons for this: first, because electricity prices in Iran are subsidized, exporting it generates nearly eight times the revenue for Iran's central electricity company, Tavanir. This is perhaps one reason why Tavanir often operates at a financial deficit, forcing it to seek any alternative source of income—hence the need for exports.

In addition, although summer and winter see high electricity demand, during the fall and spring, Iran has excess electricity and must export it to retain foreign customers. A similar situation exists in Iran's gas market. Finally, commentators

note that electricity exports serve as a tool for political influence. Iraq, for example, depends significantly on Iranian electricity, giving Tehran substantial leverage over Baghdad's leadership.

The nuclear dilemma

Iran's energy crisis is exacerbated by its international stance and its conflict with Western countries over its nuclear program. If in the past North Korea was attributed with the statement that its leadership would prefer its citizens to eat grass rather than abandon its nuclear program, then the Iranians are approaching a similar situation today.

Beyond the fact that Tehran funnels enormous funds to its proxy organizations in the Middle East and its nuclear program—estimated to fund Hezbollah alone at about $1 billion annually—the confrontation between Iran and the US has led to a strict sanctions regime on the Islamic Republic, which over the years has crippled its ability to meet its citizens' basic needs.

For example, sanctions prevent it from advancing nuclear developments or building additional nuclear power plants beyond the one in Bushehr. Iran also cannot refurbish its electricity infrastructure or construct new conventional power plants. Sanctions further prevent Iran from developing its vast gas fields, leaving valuable resources unexploited. The reason is that Iran struggles to attract investors who could assist it economically, and international experts avoid the country. Moreover, Iran lacks some of the components necessary for such projects, such as compression platforms for its gas fields.

Renewables, a missed opportunity

One potential solution to the energy crisis may lie in transitioning to renewable energy. Currently, only a negligible portion of the country's electricity is generated from renewable sources. Iran has minimal infrastructure for such projects, and what little exists is not connected in a way that would allow for significant savings in fuel consumption or reduce electricity lost through the national grid.

If in 2023, the Islamic Republic built infrastructure for about 75 megawatts of renewable energy production, other countries in the region, such as Saudi Arabia

or Turkey, constructed facilities with production capacities 40 to 50 times higher. The government in Tehran had set a target of achieving renewable energy production capacities of nearly 3,000 megawatts, making this a clear failure.

In some parts of Iran, the sun shines for 300 days a year, making solar power generation especially ideal for Iranians. However, to secure the necessary financial guarantees for such initiatives, Iran needs relief from the sanctions regime. This is one of the goals set by President Pezeshkian when he assumed office following the untimely death of his predecessor, Ebrahim Raisi. The smiling face Pezeshkian presents to the West is partly intended to promote the resolution of the electricity problem with the help of international entities.

Ironically, if Iran were permitted to build additional nuclear power plants, it could improve its electricity sector. As a signatory to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), it is supposed to benefit from the expertise and knowledge accumulated by the International Atomic Energy Agency (IAEA) in the field of civilian nuclear power. However, because Iran is suspected of pursuing military nuclear capabilities, both the IAEA and other nations worldwide refuse to share nuclear technologies such as reactors and fuel, fearing they could be diverted for non-civilian purposes.

Another obstacle facing Iran is that it appears on blacklists for money laundering and financing terrorism, placing it among a group of nations denied access to advanced technologies of certain kinds. This means that as long as Iran continues to fund its regional proxies, it will struggle to provide for its citizens and modernize its national electricity grid.

Trump’s return and rising tensions

To all this, one must add the new reality Iran is facing these days. After several years in which a Democratic administration in the US somewhat eased the burden of sanctions on it, Donald Trump’s re-election to the White House raises significant Iranian concerns about what lies ahead. Just days after his victory, reports emerged that on his first day in office, he intends to renew the “maximum pressure campaign” against Iran, attempting to bring it to its knees over its nuclear program. Such a scenario will not contribute to Tehran’s economic recovery and certainly will not assist in rehabilitating its electricity infrastructure. During his previous term, the Trump administration imposed

sanctions on Iran's petrochemical industry, and it is likely that this sector will again be a focus of sanctions.

Additionally, following Iran's ballistic missile attack on Israel on October 1, it was reported that among the targets considered by the IDF for retaliation were Iranian refineries, oil fields, and nuclear facilities. Although it is unlikely that Israel would target an operational nuclear power plant like the one in Bushehr, and would instead focus on sites such as Fordow and Natanz, oil infrastructure could be another possible target. Such an attack would not only risk fluctuations in the global oil market but would also have extensive implications for the local electricity market in Iran.

As usual, in such a case, the Iranian citizens themselves would bear the brunt of the consequences rather than the leadership, which would undoubtedly be safely ensconced in fortified bunkers equipped with advanced generators. However, one of the key questions facing the Iranian leadership regarding its ongoing direct confrontation with Israel is how far it can stretch the suffering of its citizens before they rise up to consign it to the dustbin of history.

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