

Assessing the Impacts of the Iran Nuclear Deal on Climate Change

Aram Kamali

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Introduction

On July 14, 2015, the international economic boycott levied against Iran was scheduled to conclude. In concert with the European Union and the P5+1, the Islamic Republic agreed to a Joint Comprehensive Plan of Action (JCPOA) whereby its capacity for nuclear development would be dramatically curtailed. Among other requirements, Iran is mandated, for a period of 15 years, to cap its uranium enrichment at 3.67 percent – a level far below the weapons-grade enrichment rate of 90 percent.¹ In exchange for these assurances, the international community has pledged to terminate the lion's share of sanctions imposed on Iran. This entails normalizing trade relations, lifting artificial investment and financial barriers, and unfreezing \$100 billion in frozen assets.²

Although not immediately discernable, the nexus of this agreement and climate change is distinctive. At the 2015 Paris Climate Conference (COP21), Iran was among the 150 nations that drafted and published its Intended Nationally Determined Contribution (INDC). The government outlined that it would cut greenhouse gas emissions by 4 percent under the condition that “unjust sanctions” are lifted and never again re-imposed.³ This stipulation indicates not a threat from the Islamic Republic, in which it wields sanctions as a tool for political leverage, but rather the impracticality of emissions mitigation without the transfer of financial investment, physical capital, or technological know-how from developed nations. Regrettably, the persistent skepticism of some European banks to issue loans may inhibit this vital process.⁴

The central goal is thus to evaluate the extent to which the JCPOA will enable Iran to fulfill, if not surpass, its mitigation targets. Now that it has reintegrated into the landscape of international relations, Iran is tasked to balance urgent economic development pressures with the principles of

environmental sustainability outlined in its INDC. It is therefore apt to highlight the implications, both constructive and destructive, that renewed international engagement holds for issues related to climate change.

Macroeconomic Conditions

To contextualize matters, consider the state of Iran's fossil fuel industry. Iran is highly reliant upon the sale of its abundant petroleum resources, as oil exports comprise roughly 50-60% of total government revenue.⁵ The sanctions' impact on this sector has been significant; in January 2012, the European Union tightened trade restrictions by placing an embargo on Iranian oil.⁶ Consequently, Iran's economy contracted by 9 percent as the government slid into a worsening budget deficit.^{7 8} Because the JCPOA will ease these restrictions, however, the full potential of Iranian oil is once again unleashed on the global market.

The revival of the oil sector will naturally complicate domestic mitigation efforts. In July 2016, Iran's oil exports increased by 70 percent compared to 12 months prior.⁹ Much to the government's delight, this growth projects to generate around \$15 billion in revenue by the fiscal year's end.¹⁰ However, as the extraction, production, and subsequent export of crude oil intensify in Iran, so too will the gas-flaring emissions associated with these activities. Apart from Russia and Nigeria, Iran flares more gas than any country in the world.¹¹

An additional cause for environmental concern is the anticipated increase in domestic energy demand. Due to projected growth in Iran's manufacturing, residential, and transport sectors, energy consumption is expected to double by the year 2030.¹² In fact, per capita energy consumption in

Iran is already 15 times that of Japan, 10 times that of the European Union, and 2.5 times that of the Middle East as a whole.¹³ The issue here is not energy consumption per se, but rather the primary sources from which the energy is derived; 60% of Iranian energy derives from natural gas, while 38% derives from petroleum.¹⁴ A business-as-usual growth scenario would therefore lead carbon dioxide emissions to double by 2030.¹⁵

Any effort to disrupt this trend has been contingent on Iran's ability to reintegrate into global capital markets. In 2012, the government revealed a plan to increase its Renewable Portfolio Standard to 5,000 megawatts (MW) by the year 2020.¹⁶ A study from the German government even deemed the country "potentially one of the best regions for solar energy utilization," reporting that average solar radiation sits between 4.5 and 5.5 kWh/m².¹⁷ Despite this potential, Mostafa Rabiee – a top official for the Renewable Energy Organization of Iran (SUNA) – lamented that a lack of project financing was inhibiting the development of Iran's renewables sector. As a result, he determined that the ambitious endeavor would require over \$10 billion in foreign investment – a highly unlikely target given the prevailing conditions of economic isolation.¹⁸

Prospects for Sustainable Development

The nuclear accord was therefore crucial in aiding Iran diversify its energy sources. Shortly after sanctions were lifted, a number of firms quickly agreed to develop solar infrastructure in Iran. The first was the Italian firm Carlo Maresca, which secured a contract in April 2016 to build a 50 MW plant on the island of Qeshm.¹⁹ The second and third firms were Italy's Denikon and Genesis, which signed a joint agreement in June 2016 to construct 100 solar energy plants in Qazvin; each of these small-scale plants is intended to produce 10 MW, therefore putting the project's total

generation capacity at 1,000 MW.²⁰ Only weeks thereafter, Germany's Planet in Green was commissioned by the government to construct a 100-megawatt plant in an undisclosed location.²¹

Within the span of two-odd months in the post-JCPOA era, therefore, Iran has arranged to increase its solar generation capacity by approximately 1,150 MW. For context, consider that Iran's solar capacity grew from a meager 53 MW in 2005 to only 67 MW by 2011.²²

Iran's wind power sector is also slated to benefit from global reintegration. In addition to its vast solar potential, Iran can fulfill roughly half of its domestic energy needs by harnessing local wind power.²³ This bright outlook underlies the commitment of Vestas, a Danish multinational, to invest \$100 million in Iranian wind infrastructure in the next five to seven years.²⁴ Concrete development projects are underway as well. Only months after the JCPOA's framework was settled, the Development Environment Arvand Company, a joint German-Iranian venture, pledged to develop a 48-megawatt wind farm in Khuzestan province. The project is overseen by the Berlin-based consultancy GI Umweltconsult, which will presumably aid in developing Iran's technical capacity.²⁵

Furthermore, the JCPOA has spurred investment in Iran's waste management sector. In 2010, landfills in southwest Iran emitted an estimated 8,405 tons of greenhouse gases, chiefly carbon dioxide and methane, to the atmosphere – given the rapid pace of urbanization in Iran, that number is projected to increase as more waste is subsequently produced.²⁶ It is for this reason that Iran both a) prioritizes waste-to-energy generation in its INDC as a mitigation strategy, and b) frames it as an area in which technological assistance is required.²⁷ Only one month after the JCPOA was implemented, Genesis – the same Italian firm investing in Iran's solar industry – agreed to spend €60 million in developing a waste-to-energy plant in the city of Qazvin.²⁸ Once made operational, the plant stands to become the largest and most effective of any such kind in the country. Developers

expect it to process between 500-700 tons of waste per day, while the next largest plant currently incinerates only 450 tons per day.^{29 30}

The mitigation potential of this technology is substantial. Organic waste can be converted to usable energy through gasification, pyrolysis, or combustion. In the former two processes, the waste feedstock is heated in a vessel to produce an intermediary liquid and/or gas;³¹ this product can then be used to generate bio-methane, which is considered a low-carbon emitting fuel alternative.³² Through the process of combustion, moreover, the waste stream is incinerated in a chamber to produce steam, which is then spun in turbines to generate electricity for local use.³³ Given Iran's anticipated growth in energy consumption, the deployment of this technology could prove indispensable to a sustainable, low-carbon future.

Conclusion

Within the context of climate change, the implementation of the JCPOA represents a double-edged sword. On the one hand, the termination of trade restrictions will allow Iran to dramatically increase its extraction, production, and export of crude oil. Although Iran pledges to improve the environmental performance of its gas-flaring infrastructure, the central issue of continued fossil fuel dependence, both nationally and globally, remains unaddressed.³⁴ One could even argue that it is encouraged, as an oversupply on the global market will keep prices low for importing countries.

At the same time, the impact of sanctions relief on Iran's renewable energy sector is immense and should not be understated. An emergent and largely energy-consumptive economy, Iran has long needed to diversify its simplistic and fossil-dominated energy mix. Now after years of political, economic, and social isolation, a sustainable energy transition for the Islamic Republic seems all the

more tenable. Large-scale foreign investment has flooded in the months following the JCPOA's implementation, thereby catalyzing development in the solar, wind, and waste management sectors. As a result, Iran may be able to accommodate its growing energy needs while still abiding by its mitigation commitments.

Given these developments, it is apt to reconsider the efficacy of sanctions in resolving international disputes. While mechanisms as such represent nonviolent alternatives to armed conflict, they impede the political and economic cooperation needed to mitigate the existential threat of climate change. For the sake of collective survival, the path of engagement and diplomacy should take precedent over the path of isolation and confrontation.

Aram Kamali is a Graduate Research Fellow at the Climate Institute and a Master's student at the London School of Economics and Political Science.

Notes

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