

Solar Energy and “Creative Resistance”: How Cuba Is Defying the U.S. Energy Embargo



The first Solinera in Villa Clara (Source: [ACN/AI-scaled](#))

In the Alcides Pino neighborhood of Holguín, a new type of facility has been operating since June on the site of a former gas station. Where gasoline was once sold, residents now charge their electric motorcycles and tricycles—using solar power, completely independent of the power grid.

For two hours a day, visitors can also charge cell phones, lamps, and fans without paying a single peso. “The number of visitors increases when the power outages last longer,” [confirmed](#) shift supervisor Agustín Cecilio Parra to the Cuban labor union newspaper *Trabajadores*. In some parts of the country, power outages now last over twenty hours a day; since the beginning of July, the power grid has [collapsed](#) completely three times.

The El Girasol station is one of 25 so-called “solineras” currently in operation in Cuba. Another 15 are in various stages of construction and planning. They are one of the most visible responses to an energy crisis that has been affecting the country since early 2026 on a scale never seen before.

Solineras: More Than Just Charging Stations

Since U.S. President Donald Trump [imposed an effective oil embargo against Cuba](#) in early January—cutting off the country’s access to Venezuelan oil and fuel imports on the world market—strict [energy rationing](#) has been in effect. Fuel is practically no longer sold, and a liter of premium gasoline costs up to six euros on the black market.

Amid this situation, a new network of small-scale infrastructure is emerging, which Cubans themselves call “Solineras”: solar stations that supply electricity to electric vehicles, phones, lamps, and cooking appliances.

The Havana-based company Empresa de la Industria Electrónica (EIE) is one of the largest operators of these facilities—and, according to its own statements, the first Cuban company to cover its entire energy needs through photovoltaics: 22 solar fields feed approximately 3,000 kilowatt-hours into the grid daily. EIE operates more than 15 Solineras in the capital alone, with additional ones located in Matanzas and Villa Clara. Their establishment is supported by tax incentives as part of the government’s ongoing [176-point reform plan](#).

What sets these stations apart from ordinary charging points is their social nature. In the Virginia neighborhood of Santa Clara, for example, where a Solinera with 56 solar panels, 50 kilowatts of generating capacity, and 30 kilowatts of storage capacity [was opened](#) in April, neighbors come by especially when power outages coincide with lunchtime. “The cooking service is free, and the community is grateful to be able to communicate and charge their portable lamps,” explained Ivette Hernández, the facility’s director. The Gomate project, which operates the station, has also donated household appliances and food to daycare centers and health facilities in the province.



In Havana’s Vedado district, a different kind of “Solinera” is currently being built. It is part of the “Rampeando” local development project in the Rampa People’s Council and is intended exclusively for charging electric tricycles used for garbage collection—with a capacity of 40 kilowatts, powered solely by solar energy.



Thirty such tricycles were donated by the municipal district, and ten are already in use. “It’s not just about installing solar panels, but about a strategy that uses solar energy for social purposes. The community supports the initiative, and we’re very happy because we’ve eliminated a large portion of the trash in the neighborhood,” said the president of the local council, Pedro Lizardo Garcés Escalona. The project also provides

employment for young people and former offenders who previously had no steady work.

In Holguín, meanwhile, Solinera El Girasol—operated by a private company and [opened](#) in June on the site of a former gas station in the Alcides Pino neighborhood—has quickly become a go-to spot for residents and transport operators. With 30 solar panels, 40 kilowatts of generating capacity, and 32 kilowatts of storage capacity, it operates completely independently of the national power grid.

Mobile phones, lamps, and fans can be charged for free for two hours a day—using identification tokens and user registration to ensure order. In addition, a fee of 50 pesos (approx. 6 cents) per hour [is charged](#). Charging an electric tricycle costs 300 pesos (approx. 40 cents) per hour. The network is set to expand further: a new station is planned for kilometer 270 of the Autopista Nacional to provide electricity to travelers on the highway as well.

“Creative Resistance”

The *New York Times* also provided striking examples in a recent [report](#) of what President Miguel Díaz-Canel described as “creative resistance” against the U.S. energy blockade. The newspaper spent a week in Cuba and described a society that is suffering—yet still finding ways to cope.

In Havana and in rural areas, many Cubans have traded in their gas-guzzling American classic cars from the 1950s for Chinese electric motorcycles and three-wheeled rickshaws. Electric rickshaws take people to work because public bus service has been suspended due to a diesel shortage—one of the most lucrative business models in the private sector at the moment. Those who can afford it—mostly those with relatives abroad—buy Chinese lithium batteries for around \$750 to keep televisions, fans, or refrigerators running during power outages. The majority of the population, however, lacks the means to do so: Wages, whose purchasing power was already low before the crisis, have now fallen to around ten euros per month due to persistent inflation.



Bars and restaurants that are still open are partly powered by natural gas generators that were originally built for liquid fuels but have been converted by Cubans. Around 280,000 households in Havana have gas connections for cooking and hot water. Since Cuba produces the gas itself and is therefore not affected by the blockade, it has become one of the few reliable sources of energy. One man the *NYT* met ran his generator on it nearly around the clock—and still paid only 50 pesos (about six cents) for his energy bill at the end of the month.

In rural areas, ingenuity takes on even more extreme forms. Humberto Palmero, a 55-year-old farmer on the coast, learned on YouTube how to distill gasoline and diesel from plastic waste. He has since built a small home refinery in his backyard, which he uses to power his motorcycle and fuel his stove. “We’re looking for solutions,” he told the newspaper. “The economic constraints are slowly killing us, but we’re fighting our way through with all our might.”

Meanwhile, the 54 large [solar parks](#) across the country cover about ten percent of Cuba’s electricity needs, up from three percent at the beginning of 2025. At midday, they supply up to 20 percent—but due to a lack of large-scale storage (currently, only one of four planned [battery storage systems is in operation](#)), hardly any of it remains after sunset, when demand is highest. The inequality is palpable: Those who have solar panels, batteries, and an electric vehicle get by. Those who don’t are left in the dark.

Jorge Piñón, an energy specialist at the University of Texas, told the *NYT* that the Cuban government is running its power plants at reduced capacity to prevent them from shutting down completely, tapping into oil residues that have been stored for years, and increasing natural gas production. At the same time, he acknowledged that he and other analysts had underestimated the Cuban government’s resilience when they predicted that fuel reserves would be exhausted by March.

Small quantities of fuel in isotanks, intended exclusively for the private sector, are entering the country from the U.S. via a [special exemption](#). Havana may have discovered additional alternative isotank channels, but nothing is known about this. Furthermore, only a single oil tanker has [reached the island](#) this year; its shipment, delivered at the end of March, provided some relief for a few weeks.

Despite the population’s resilience, public discontent is high—and it is not directed solely at Washington. Protests usually take the form of nightly pot-banging in neighborhoods acutely affected by power outages or shortages; open street protests carry the risk of imprisonment: “I can’t put my family in danger,” one resident told the newspaper, explaining the absence of larger protests.

U.S. Secretary of State Marco Rubio [stated](#) on the anniversary of the July 11, 2021, protests that the Trump administration would continue to use “all available means” to achieve its goal of overthrowing the Cuban government. Cuba, for its part, is seeking dialogue. “Cuba is not an enemy of the United States,” Deputy Foreign Minister Carlos Fernández de Cossio told the *New York Times*. “What we want is a constructive and respectful relationship.”

“And here we are”

Solineras in the cities, makeshift distilleries in the countryside, solar panels on rickshaws—taken together, this does not paint a picture of triumph, nor one of collapse. It is the image of a society searching for ways out amid extreme hardship, relying on solidarity where infrastructure fails.

At the Fidel Castro Museum in Havana—where the lighting worked but the air conditioning was out—de Cossio told the *New York Times* that the strength of Cuban society was the

main reason why, so far, “the point of having a humanitarian crisis has not yet been reached.” “The intimate expectation in political circles in the United States was that Cuba could not survive beyond April. And here we are,” he added. ([Cubaheute](#))