STRENGTHENING ENERGY SECTOR RESILIENCE IN JAMAICA:

FREQUENTLY ASKED QUESTIONS

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FROM THE AMERICAN PEOPLE

Do you represent a Jamaican business that is interested in going solar? "Strengthening Energy Sector Resilience in Jamaica" is a three-year program co-funded by the United States Agency for International Development (USAID) and the Jamaica Energy Resilience Alliance (JERA). JERA offers specialized support to Jamaican businesses seeking to reduce electricity costs and green their operations with clean energy. These FAQs are designed to give you an overview of technology, benefits, and financing options to help your business go solar.

JAMAICA ENERGY RESILIENCE ALLIANCE (JERA)

1. What is JERA and who are the JERA partners?

The Jamaica Energy Resilience Alliance (JERA) is made up of Cadmus and its partners: Jamaica Hotel and Tourist Association, LASCO, UWI-Mona, Green Solutions International, RMI, Wigton Windfarm, Xergy Energy, and WRB Energy. In partnership with the United States Agency for International Development (USAID), JERA is offering specialized support to Jamaican businesses seeking to reduce power costs, increase reliability of supply, and "go green" in their operations in an effort to strengthen Jamaica's energy sector. See our program brief for more information on each partner and their respective roles.

2. Does JERA provide any financing to support a solar project at my business?

JERA includes solar energy developer partners (WRB Energy and Wigton Windfarm/Xergy Energy) with up to 50 million USD in investment funds available to support solar photovoltaic (PV) or PV plus battery storage (PV+) project implementation to build resilient, distributed energy for Jamaican businesses.

3. How do I access financing available from JERA partners?

If you are interested in learning more about your options for PV and PV+, sign up on the JERA website: www.cadmusgroup.com/go-solar. After signing up, we will request additional information including 12 months of pre-COVID energy bills; JERA partners will review your information and contact you for a follow-up conversation to discuss your options for PV and PV+. If your project is eligible for investment from JERA partners, they will request 3 years of your business' financials, and work with you through financing and installation options. If not, we will suggest alternative financing options that may better suit your needs.

JERA will not sell any personal information collected to any third party. Information will be shared only with JERA investment partners for the purpose of assessing eligibility for PV or PV+ financing and installation.

SOLAR PV AND HOW IT WORKS

1. What is solar photovoltaic (PV) technology?

Solar photovoltaics (PV), commonly referred to as solar panels, convert the sun's energy into electricity. There are two main types of solar PV:

- Utility-scale projects require large, open spaces and produce a lot of electricity, like a standard power plant.
- Distributed solar projects are smaller and are often found on-site at homes or businesses. These projects help customers (like you) produce their own electricity and secure more reliable power.

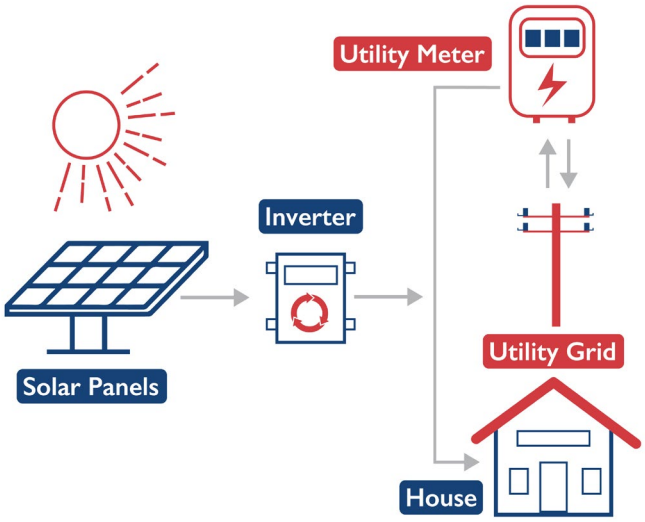


Figure 1: Solar PV System

Often, distributed solar is connected to the electricity grid. The solar panels provide some of the required electricity and the grid provides the rest. Or, when more electricity is produced than consumed, the excess can be sold back to the grid through Jamaica's net billing program (see below).

Distributed solar can also include battery systems to store excess power for use when the sun isn't shining. With enough batteries, these systems can power homes and businesses by themselves, but most often they are also connected to the grid to ensure that power supply is reliable.

2. How do solar PV panels work?

Solar PV panels are made up of cells that convert the sun's energy into direct current (DC) electricity. DC electricity is sent to an inverter that converts it into alternating current (AC) electricity, which can be used on-site, stored, or sent to the grid.

3. Is solar PV reliable?

Solar power systems are incredibly reliable. In 2017, the National Renewable Energy Laboratory (NREL) at the U.S. Department of Energy released a report detailing that the percentage of panel replacements was less than 0.05% annually for 54,000 PV systems installed in the U.S. between 2000 and 2015.

Of course, the reliability of PV systems depends on the equipment installed, the quality of the installation, and the operation and maintenance of the system throughout its lifetime.

4. Do my solar panels produce power when the sun isn't shining?

Your solar panels will produce energy even on cloudy days, though the amount generated will be lower. However, given Jamaica's geographic location, with ample sunshine, PV is an efficient and cost-effective power source.

Your solar energy system will not produce energy at night. A battery connected to your solar system will allow you to store energy for use when the sun isn't shining.

5. How long will my PV system last?

While some components may need to be replaced during the lifetime of the system, typical solar energy systems are capable of generating electricity for 25 to 35 years. The useful life of a battery ranges from 5 to 15 years.

6. What happens at the end of a PV system's life?

At the end of a PV system's life, it will need to be uninstalled by a team of professionals. The landscape on recycling and repurposing solar panels is currently evolving.

1. What is PV plus battery storage (PV+)?

PV+ refers to a PV system with a combined battery storage system. Common battery technologies include lead acid and lithium ion. In general, lead acid batteries are cheaper but have shorter lifespans and are less efficient than lithium ion. In either case, batteries can be charged both from your solar panels or from the grid (in the case of a grid-tied system).

2. What are the benefits of adding battery storage to my PV system?

Battery storage can add several benefits to your PV system including:

- *Resilient Backup*: Batteries offer resilience benefits by providing backup power during power outages, allowing you to continue operating critical equipment.
- *Demand Management*: Batteries can be used during periods when electricity consumption is highest to reduce peak demand (and associated demand charges).
- *Increased PV Utilization*: Because energy sold to the grid is compensated at a lower rate than energy consumed from the grid, customers in Jamaica may benefit more by maximizing consumption of PV generated electricity.

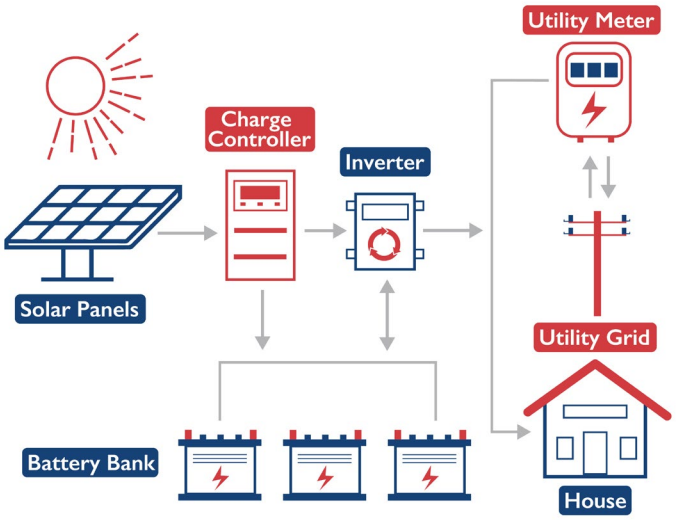


Figure 2: Solar PV plus battery storage (PV+) system

3. How long do battery storage systems last?

Batteries degrade over time, like those in your cell phones do. Depending on the size and type of battery you are installing with your PV system, the useful life of a battery ranges from 5-15 years. It is likely that over the course of your PV system's life (25 to 35 years) you will need to replace the battery at least once.

4. Can I go off-grid with a PV system?

Installing solar panels does not change an existing connection to the grid. Businesses can continue to draw power from or send power back into the grid, depending on how much power is used.

It is possible for solar energy systems that include battery storage to allow businesses or homes to go off-grid. An off-grid system would require enough solar panels to generate a full days' worth of power during the daylight hours and ample battery storage capacity to store and release that power during the night. There are additional costs associated with a battery storage system; however, there are additional benefits as well. Battery storage provides reliable and resilient backup electricity, allowing you to continue operating critical systems during grid outages (e.g., extreme weather incidents).

5. Do solar panels work during a power outage?

Without batteries, solar PV systems will send surplus power back into the grid. In the event of a power outage or blackout, a grid-tied solar system will automatically shut off to prevent injury to emergency responders and utility repair workers. However, with batteries, a system could continue to operate and provide backup power when the grid is down.

6. Will PV+ systems withstand severe weather events such as hurricanes?

Yes, if your system is installed to meet hurricane standards. Systems can be designed or installed such that they are more likely to withstand extreme weather events. Check with installers ahead of time to see how they follow resilience standards. NREL has a recent report on this topic.

7. What happens at the end of a PV+ system's life?

At the end of a PV+ system's life, it will need to be uninstalled by a team of professionals. The landscape on recycling and repurposing solar panels is currently evolving.

BENEFITS OF INSTALLING SOLAR

1. What are the financial benefits of PV?

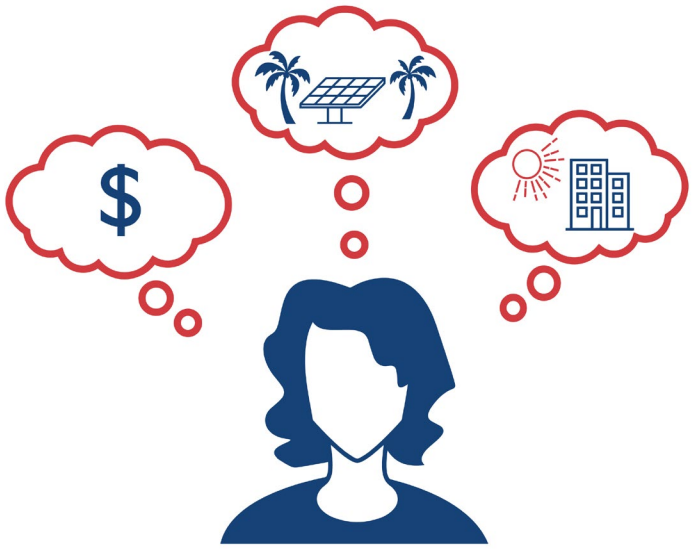
PV+ may provide electricity at a lower cost than you may pay from the grid, reducing your business's operating costs even while paying back the cost of the system.

2. What are the environmental benefits of PV?

Powering your business with clean, renewable energy can help you achieve sustainability goals and attract an increasingly environmentally-conscious customer base.

3. What are the resilience benefits of PV?

Solar plus battery storage provides reliable and resilient backup electricity, allowing you to continue operating critical systems for periods during grid outages.



COSTS, INCENTIVES, AND FINANCING OPTIONS FOR PV AND PV+

1. How much does a solar PV system cost?

The costs of a PV or PV+ system, associated payback periods, and financial returns will vary from project to project and depend on several variables including: your electricity demand and consumption patterns; your available and suitable space for installation (ground, roof, parking lot, etc.); your desired use of the system (resilience, demand management, maximizing financial returns from solar generation); whether the system is grid-tied or off-grid; whether the system includes battery storage or not; your preferences around ownership and financing; and if you finance, your credit.

2. How much will PV system maintenance cost?

Solar panels require minimal maintenance, including cleaning, throughout their 25- to 35-year lifetime. In case of unanticipated issues, most equipment manufacturers include warranties. If you lease a system from one of our partners, they will maintain the system during the lease period.

3. Will I still receive an electric bill if I have a PV system?

You will still receive a bill from your utility if your solar energy system is connected to the grid, but depending on the size of your solar PV system compared to your energy use, you can dramatically reduce the amount you are paying. See also the question below on net billing.

4. How do I find out how much I pay for electricity?

Viewing your electricity bill from your utility is an easy way to find out how much you pay for electricity, and how much electricity you use per month.

5. What are my PV financing options?

There are two ways you can go solar:

- With direct ownership, you own the system and are responsible for securing financing, installing, operating, maintaining, and decommissioning services.
- With third-party ownership (TPO), another company builds, owns, operates and maintains the system and contracts with you to benefit from the electricity.

- *Lease Financing* is the TPO option offered by JERA partners. Like operating leases for other equipment, lease financing allows customers to lease PV or PV+ systems over time through predictable monthly payments. Leases can be from 5 to 12 years or more, depending on the wishes of the client.

6. How much will I save on my electricity bill with a PV+ system?

It is possible to save up to 30 percent on the electricity generated under the right conditions. Savings depends on several factors though. The first is the term of your loan or lease -- a shorter term will mean faster payoff when the power the system produces will be nearly free, but the monthly payments will be higher. A solar system can also help to reduce your peak demand, and therefore your demand charge. Should I buy or lease my PV system?

The answer to this question is particular to your circumstances, which JERA partners can help assess. Buying upfront, if you have the capital, can maximize your financial returns since there are no finance charges. There are opportunity costs for that money though, as you may have other needs like extending or renovating your facilities. Leasing gives you access to more capital, so you don't have to use your own lines of credit, while helping you to generate your own power at a potentially reduced cost.

7. What is Net billing?

Net billing is a mechanism that allows you to sell excess power generated by your PV system back to the electric utility (JPS). Jamaica's Net Billing Program is run by the Ministry of Science, Energy, and Technology (MSET). Bi-directional meters installed by JPS measure electricity consumed by the customer from the grid and electricity exported to the grid from the PV system.

Each month, customers are credited for electricity exported to the grid at a rate based on the avoided cost of generation (approved by OUR), at a net billing rate lower than the retail rate of electricity. If the amount owed to the customer is greater than the amount due for electricity consumed, the credits carry over to the next billing period. At the end of June and December each year, credits owed to the customer are paid in full by JPS. There are size limitations for this program – 10kW for homes and 100kW for businesses.

INSTALLING SOLAR

1. How do I choose a solar installer?

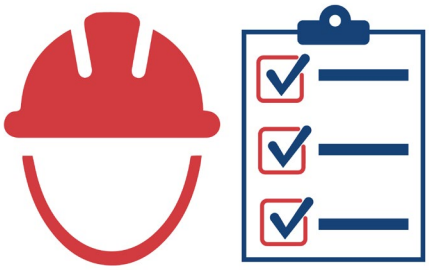
There are a few criteria that everyone should use when choosing a solar installer: confirm that they are certified, licensed and insured; have relevant experience; and can provide references. To simplify this process, JERA has worked to pre-qualify two investor partner teams (WRB Energy and Wigton Windfarm/Xergy) that can support you through the installation process, including system design and sizing, financing, permitting, equipment procurement, construction, and maintenance. JERA is also developing a list of pre-qualified installers for those who don't want financing.

2. What happens during the PV+ installation process?

Response forthcoming

3. What will the installer need access to at my facility?

During system design and installation, the installer will need access to your power meter, electrical connections, electrical box, equipment that use a lot of power, generator (if you have one), and rooftops or land where solar panels and batteries could be located. They will also need space to stage the installation.



AM I READY FOR SOLAR?

1. Is my property suitable for a solar PV system?

PV systems can be roof-mounted, ground-mounted, or building-integrated. Roofs should be in good condition to withstand the weight of the system. The best sites are south-facing for maximum exposure to the sun. Suitable sites should be free of shading from trees or buildings. JERA partners can help you determine if your site is suitable for solar and design a custom system that meets your needs.

2. What size solar PV system do I need?

The size of your system depends on your energy consumption, the amount of energy you want to offset with the solar PV system, and the space available to install the system. After you sign up indicating your interest in potentially installing a PV or PV+ system, one of JERA's solar developer partners will review your business' energy consumption and suitability for solar. They will work with you to design a custom system for your site. They will also talk through the options of grid-tied versus off-grid and adding battery storage. If you choose to install a PV+ system, the battery size will depend on the benefits you hope to ultimately achieve from your system (e.g., grid independence, backup power during outages).

3. Should I install batteries with my PV system?

The presence and size of battery storage will depend on your use and the benefits you hope to achieve:

- Batteries sized to critical load can offer resilience benefits by providing backup power during outages and continuing operations of critical equipment.
- Batteries sized based on peak demand can be used during periods when electricity consumption is highest to reduce peak demand (and associated demand charges).
- Batteries sized relative to the size of the PV system allow customers to benefit more by maximizing consumption of PV electricity generated than by exporting to the grid because net billing rates in Jamaica are lower than the retail rate.

4. How do I get started?

Sign up today to learn more about the options available to you at your business.