

ENERGY BUZZ

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Ministry of Communication, Works,
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Brades, Montserrat, MSR1110

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FROM THE MINISTER'S CHAIR

Money is going out of Montserrat every day to pay for our basic needs, food and energy. These commodities need to be imported. What if we keep this money on the island and make it very active among its people? Money that is sent to oil companies can remain on island. For this to occur Montserrat will need to make use its indigenous energy resources.



There is a lot of talk about food security but just as important is our energy security. Global oil prices are rising, thus increasing the cost of living to residents on island. Montserrat's cost of electricity is already one of the highest in the region. This raises the cost of doing business on Montserrat. A huge portion of our GDP is spent on fossil fuel import and this is not a sustainable situation. We must transition to using our local energy resources.

Montserrat is blessed with multiple resources; wind, solar and geothermal, that can be utilized to provide our energy needs . To chart a way forward an Energy Task Force was set up to review all options and make recommendations. The report is complete and MCWLE is reviewing the recommendations. The Ministry is committed to finding the most optimal mix of renewable energy options to power the island.

The Power to Change is Montserrat's Energy Policy and one of its primary objective is to make Montserrat a world class example of renewable energy use. This will be achieved by providing secure energy supplies at internationally energy prices and a small carbon footprint, capable of supporting medium and long term economic growth, social development and environmental sustainability. The Energy Unit at MCWLE is dedicated to achieving this objective.

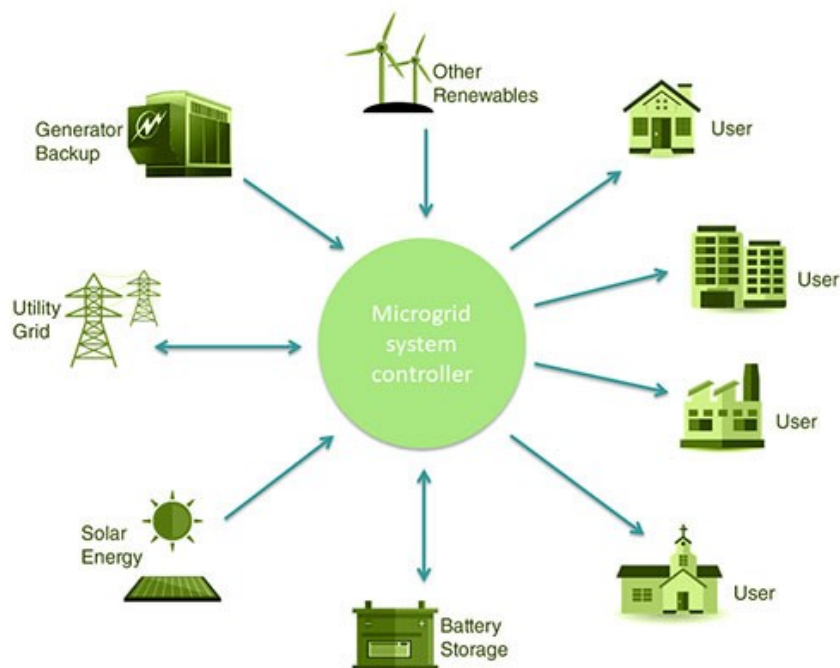


MICRO-GRIDS EXPLAINED

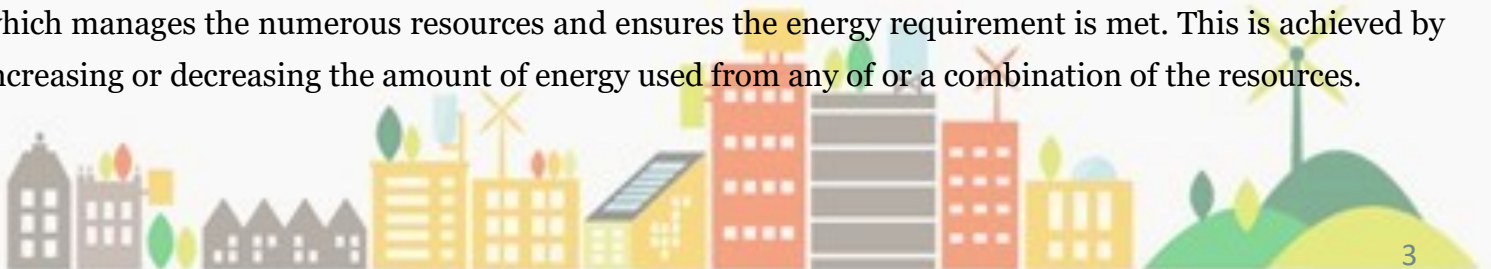
A micro-grid is a decentralized group of electricity sources that are used to provide grid backup or off-grid power to meet electrical needs. The “micro” aspect means that it is smaller than the utility-scale grid and range from a single building to an isolated village. To be a “grid” the system must generate electricity via one or a combination of fossil fuels and/or renewable energy sources (Adelfang, 2017).

There are three types of micro-grids:

- Remote Micro-grids or off-grid micro-grids, which operate in ‘island mode’ as they are physically isolated from the utility grid.
- Grid-connected Micro-grids, which are physically connected to the utility grid via a switch mechanism, but can be disconnected as needed.
- Networked Micro-grids or nested micro-grids, which consist of several nodular micro-grids that are connected to the same utility grid and serve a wide area.



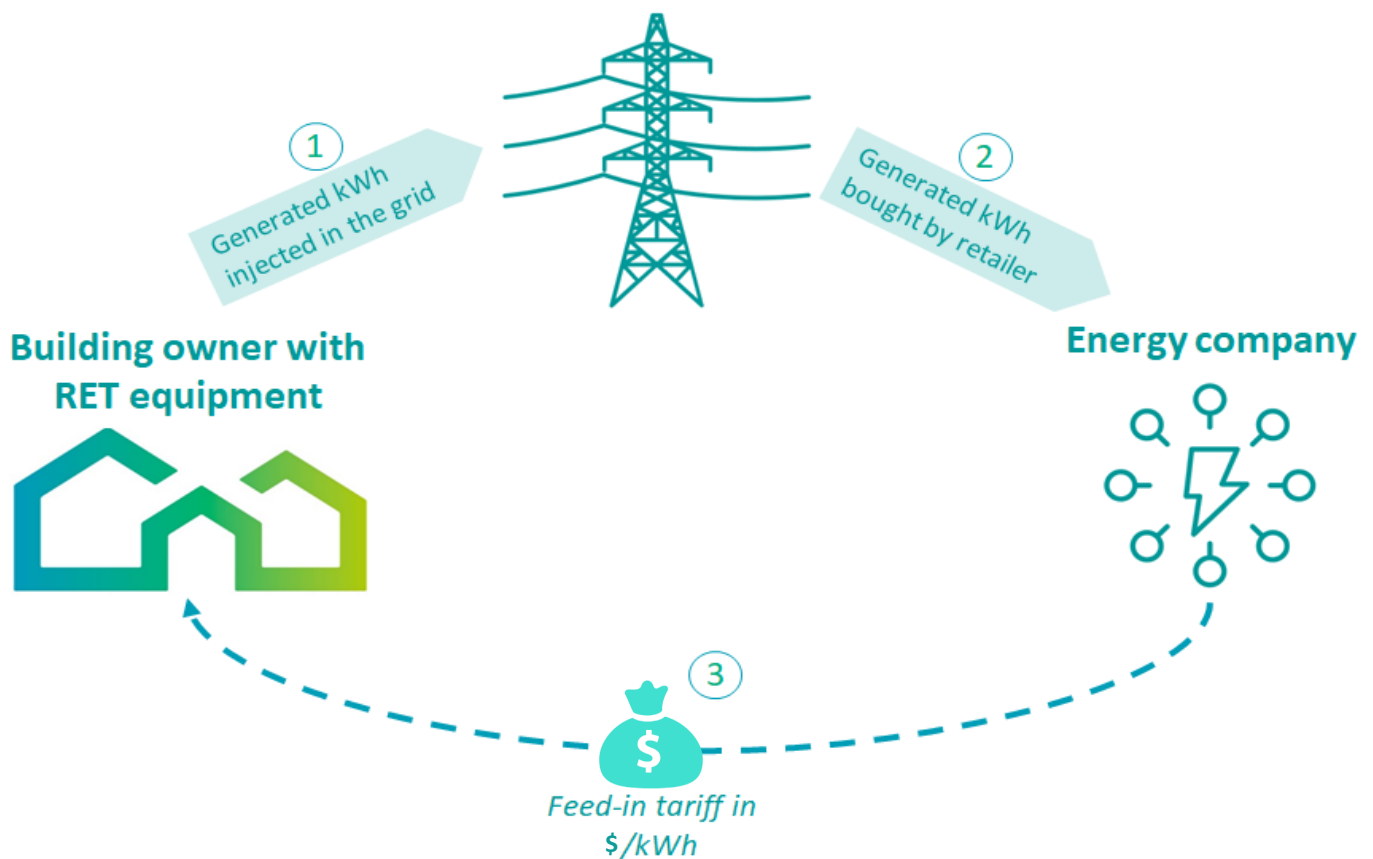
Micro-grids create local energy for nearby customers and overcomes the inefficiency of energy loss due to distribution over long distances. As they can operate independent of the utility grid, they can supply power to their customers when there is an outage. The micro-grid controller is an intelligent system, which manages the numerous resources and ensures the energy requirement is met. This is achieved by increasing or decreasing the amount of energy used from any of or a combination of the resources.



FEED-IN TARIFFS

What are Feed-in Tariffs and what is their importance?

Feed-in Tariffs (FIT) are electricity prices that are paid to renewable energy (RE) producers for the units of energy produced and injected into the electricity grid. These produces are external to the utility company. This is an initiative to promote the development and implementation of RE. The FIT is determined based on the levelized cost of electricity (LCOE) from the RE and are usually involve long-term contracts, but tends to be lower than the retail price of electricity.



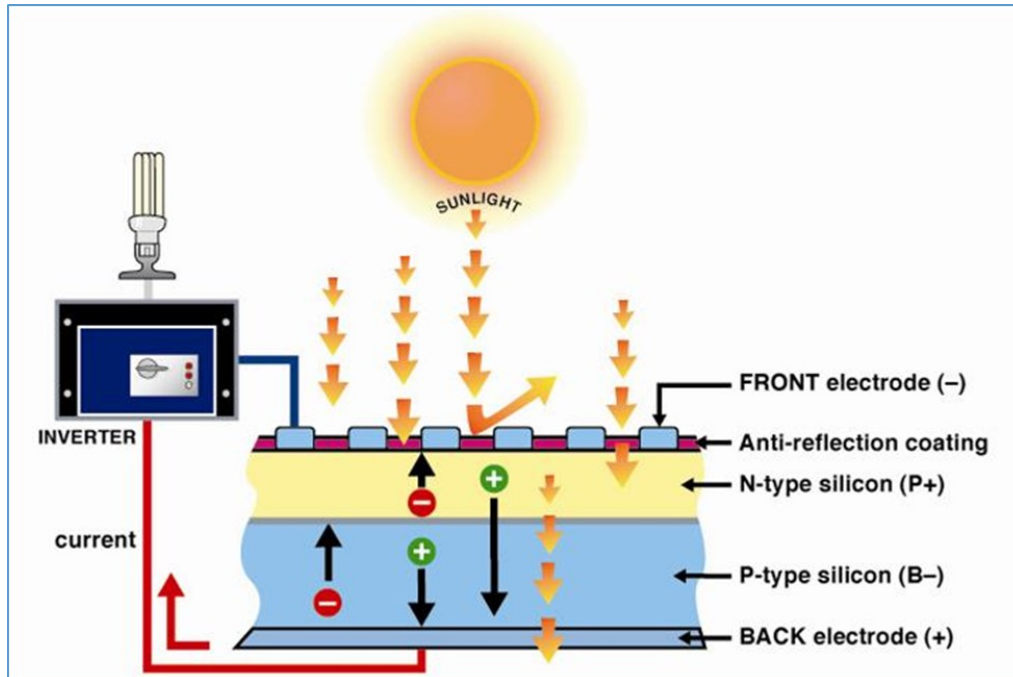
Fit provides benefits such as increasing investment into the technological innovations, securing domestic energy supplies and reducing the dependency on imported fossil fuels, and reducing CO₂ emissions. It also reduces the investment risks of these projects for investors and financing companies as FIT combined with the long-term contracts provide a level of security.

As with many schemes, there are also disadvantages to include a likelihood to cause an increase in the cost of electricity to consumers,



HOW DOES SOLAR PV WORK

Solar Photovoltaic (PV) systems use cells to convert sunlight into electricity. These cells consist of at least two layers of a semi-conductive material, usually silicon. These layers are normally altered to give each layer either a positive or negative electrical charge and create an electrical field. The photons from the sunlight, excite electrons in the negative silicon layer, which are then pushed out of the electrical field. Metal plates collect the electrons and transfer them to wires, where they flow along the circuit.



As a single cell would not produce much electricity, each solar panel or module comprises of numerous cells; most commonly 60 or 72 cells. These modules can then be grouped in arrays to produce the wanted quantity of solar power. The power is produced as Direct Current (DC), and is converted to Alternating Current (AC) or usable electricity by an inverter.



750KW PV SOLAR PROJECT UP- DATE

PROJECT OVERVIEW

The Montserrat 750KW Solar PV + 2.5MW / 1.088 MWh Battery Energy Storage System Microgrid Project (750kw Solar PV Project) is phase 2 of the 1MW Solar PV plus 1MWh Battery Energy Storage Project funded by the European Union EDF11 Program. The project is being implemented by the Ministry of Communications, Works, Labour and Energy with assistance from Montserrat Utilities Limited. The Engineering Procurement and Construction Contractor is Salt Energy of Marathon, FL, USA.

PROJECT SUMMARY

The 750KW solar PV project is within the Construction Stage consisting of Civil Works, Electrical Works, PV Modules Installation, Battery Installation, Communications Installation Works and Commissioning.

PROJECT STATUS

Task	% Complete
Civil Works	85%
PV Installation	65%
Battery Installation	10%
Electrical Works	40%
Communication Works	10%
Commissioning	0%

Current Overall Completion Percentage = 35%

The 750KW Solar PV Project is on schedule to be commissioned in August 2021.



THE FUTURE OF SOLAR LOOKS BRIGHT

Solar power was previously generated mainly by means of ground-mounted or rooftop panels. But thanks to all the advancements mentioned below, solar is set to become lighter, more flexible, and applicable everywhere.

Floating Solar

Limited crown lands locally are a limiting factor in the expansion of solar PV, however the development of floating solar farms offers an opportunity for expansion. Floating solar farms have the potential to generate massive amounts of electricity without consuming valuable land or real estate. Floating photovoltaic panels are less expensive to install than land-based panels. Furthermore, research has shown that the power production of floating solar panels is increased by up to 10% due to the cooling effect of water.



Building Integrated photovoltaics

Building-integrated photovoltaics (BIPV) serve two functions: they serve as the structure's outer layer while also generating electricity for on-site use or export to the grid. BIPV systems can save money on materials and electricity, reduce pollution, and improve a building's architectural appeal. PV panels can be integrated into building facades, replacing traditional glass windows with semi-transparent thin-film or crystalline solar panels. PV material is used to replace roofing material or, in some cases, the entire roof. Ultra-thin solar cells can be used to create semi-transparent surfaces that allow daylight to pass through while producing electricity.



Solar Skin

Solar Skins are a novel PV technology that allows for the incorporation of custom designs into solar panel systems. Solar skin technology is similar to ad wraps seen on bus windows. They can be personalized to display company logos, advertisements, a country's flag, and so on. Moreover, solar skins utilize rail-less racking systems, sit lower, have a sleek finish, and hide metal components, giving the panels a super cool look.

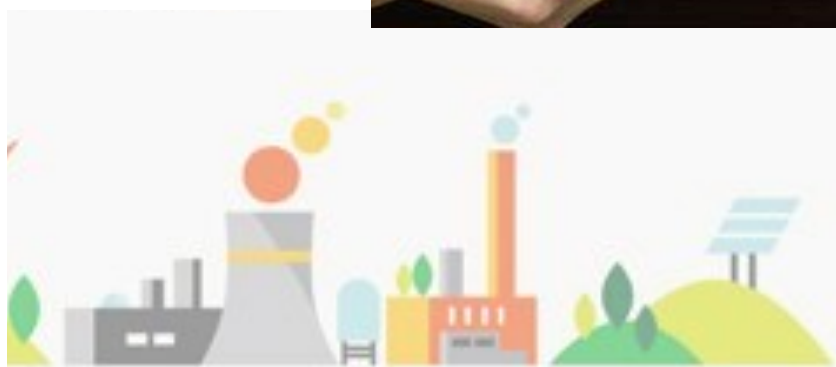
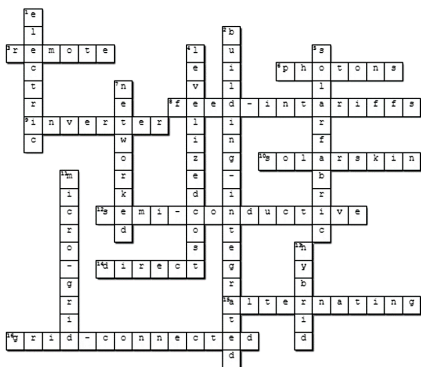


(A comparison of a standard solar panel installation (L) and solar skins on top (R))

Solar Fabric

Solar radiation is available all over the planet, so why not generate your own energy wherever required? Imagine that besides producing solar power at a fixed location, you could also do it while on the move through your own clothing.

Researchers are developing solar fabrics with a vision of including solar power in each fiber. These solar filaments can be embedded into your t-shirts, winter coats, or any other clothing to help you keep warmer, power your phone, and provide energy for other needs while you're on the go.



THE EV CAMPAIGN

The EV Campaign aims to educate the public about the benefits of buying a hybrid or full-electric vehicle. It aims to also highlight the economic benefit to purchasing these vehicles with the current tax exemptions offered by GoM. This information will be disseminated via social media platforms, flyers, and interactive radio spots.

There will also be a Hybrid and Electric Vehicle Expose, showcasing the vehicles currently on island. The owners/drivers will be there to provide their experiences, as well as representatives from two financial institutions.

This expose is done in conjunction with MSO Do It Best, who are the local automobile dealership for Nissan and Suzuki.

The Energy Unit Presents

BREAK FREE OF GASOLINE

AN ELECTRIC AND HYBRID VEHICLE EXHIBITION

Come see local hybrid and full-electric vehicles on display at Ryan's Complex, Friday 11th June 10:00am to 2:00pm.

Speak to a(n):

- Owner of EVs and HEVs
- Representative from the Energy Unit, MCWLE about the exemptions available
- Financial institutions
- Automobile Dealer



St. Patrick's Co-operative Credit Union Ltd.
P. O. Box 337 Brades • Montserrat W. I.
Tel: (664)491-3666 • Fax: (664)491 6566 • Email: info@spccu.ms

S.R.O 29 of 2019

Customs Duties and Consumption Tax (Electric and Hybrid Vehicles) Exemption Order

A person is exempted from:



Customs Duties (35%) on the importation of a plug-in hybrid vehicle.

Consumption Tax (15%) on the importation of a hybrid vehicle other than a plug-in hybrid vehicle.

Both Customs Duties (35%) and Consumption Tax (15%) on the importation of:
(a) 100% electric vehicles (EV)
(b) Charging stations
(c) Replacement batteries and charging stations

Expires 1st August 2021

Expires 1st August 2021

Expires 1st August 2024

2020 ENERGY STATISTICS

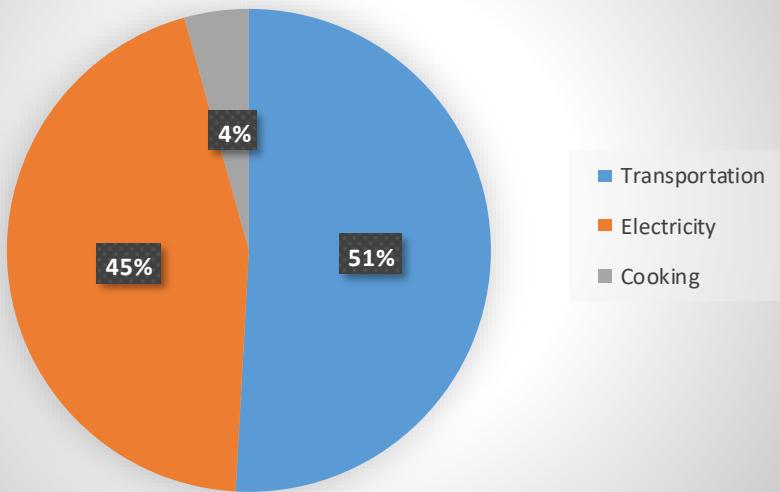
The pie charts depict the overall fuel consumption on Montserrat for 2019 and 2020. When compared, the data shows changes in usage that can be attributed to numerous factors. The consumption from cooking remains relatively the same over the two years, whereas great changes are seen between electricity and transportation. Transportation fuel consumption saw a decrease of 18% while there was a marginal increase for electricity generation fuel consumption of 0.6% and 9% for cooking (LPG). There

was an overall reduction in the annual fuel consumption of 8.36% between 2019 and 2020.

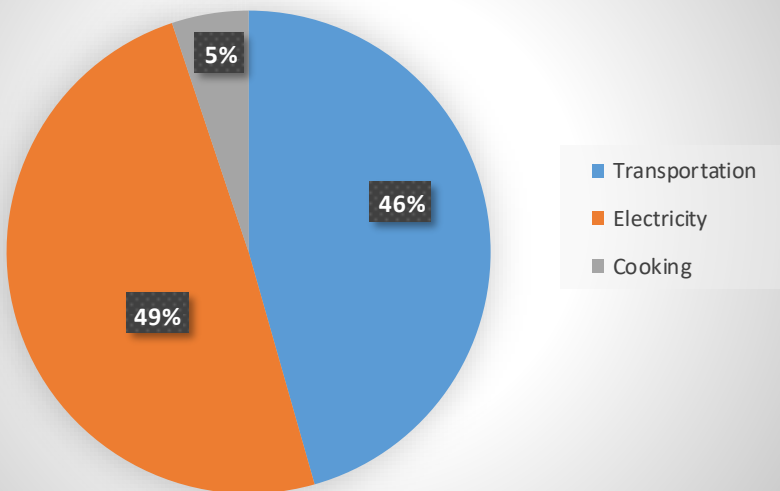
The main reasons for this was the recent COVID-19 pandemic, which caused the country to be placed in varying levels of lockdown for about 3 months, mid-March-June 2020. During the stricter part of the lockdown, persons were solely permitted to travel to and from supermarkets, thus reducing the amount of fuel used for transportation by 70%. As the restrictions were slowly lifted, fuel consumption in the transportation sector returned to normal.

Contrarily, as persons were then expected to work from their individual homes and students had to attend school via zoom classes, the amount of electricity used increased.

Overall Fuel Consumption 2019



Overall Fuel Consumption 2020



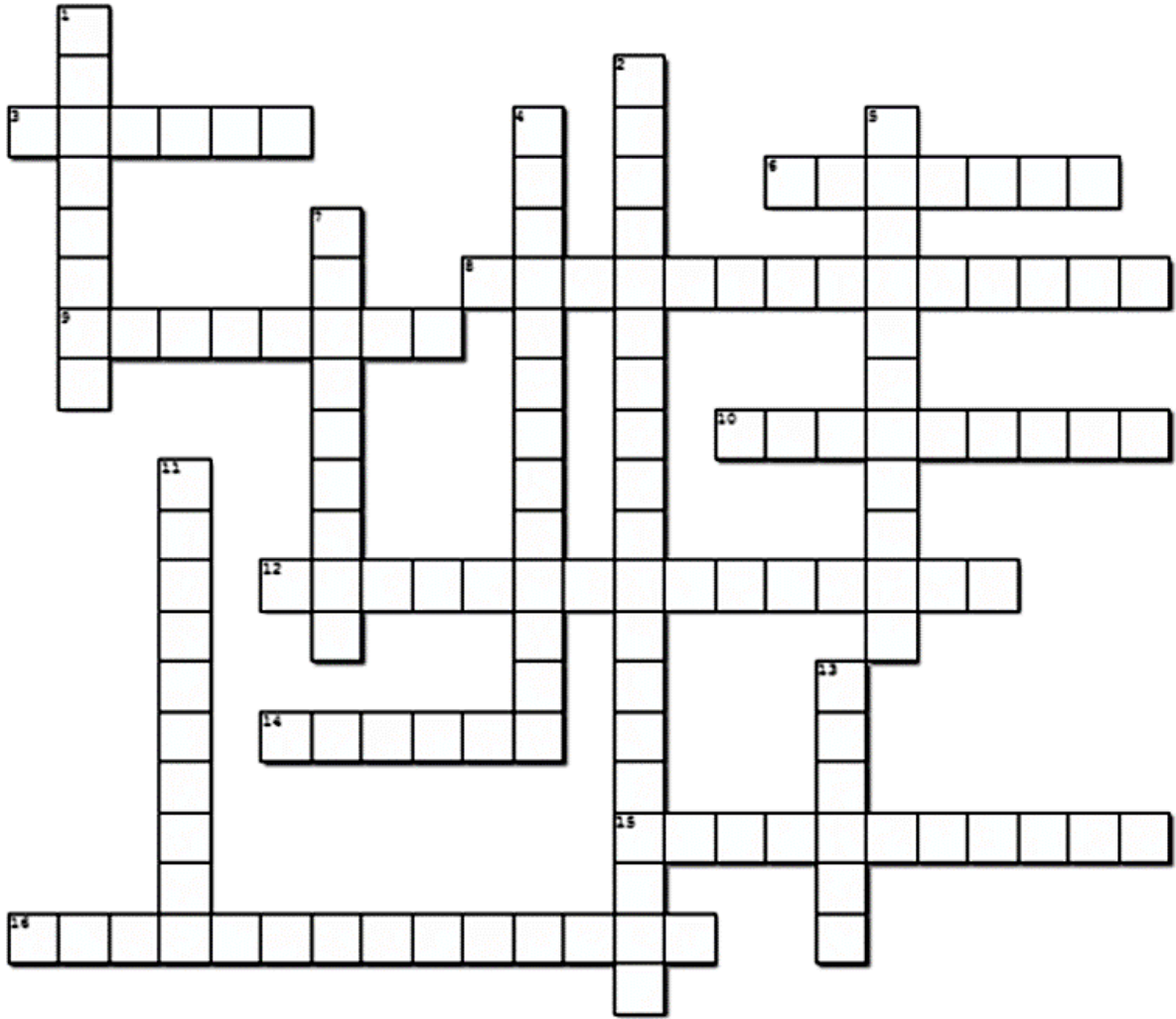
DIRECTOR'S WRAP-UP

Montserrat is blessed with an abundance of indigenous energy resources. The island's ability to harness these resources with minimum financial input is critical to its future development. In 2020, 3.3% of the electricity generated by Montserrat Utility Services was generated from the 250 kW solar system installed on the rooftops of the Montobacco Building, PWD Workshop, and the Brade power station. With the commissioning of the Look Out Solar PV farm, it is anticipated that Solar PV will generate 12%-14% of the electricity generated on the island. These systems will be interconnected with MUL's existing generating assets; hence every customer will be supplied with some level of clean and sustainable energy.



In this issue of the Energy Buzz, we have taken a closer look at current and future of Solar PV. As the government continues its trust towards increasing the penetration of renewable energy on the island and new exciting Solar PV innovations enter the market, Solar PV is poised to play an integral role in Montserrat's future energy landscape. Additional policies and strategies are needed to increase the technology uptake locally. However, the future of Solar looks bright!





Across

3. Micro-grid which operate in 'island mode' as they are physically isolated from the utility grid.
6. The smallest discrete amount or quantum of electromagnetic radiation emitted by the sun
8. Electricity prices that are paid to renewable energy (RE) producers (two words)
9. A power electronic device or circuitry that changes direct current to alternating current
10. A novel PV technology that allows for the incorporation of custom designs into solar panel systems (two words)
12. Material PV Cells consist of
14. One directional flow of electric charge
15. An electric current which periodically reverses direction and changes its magnitude continuously with time
16. Micro-grids physically connected to the utility grid via a switch mechanism

Down

1. A vehicle that uses one or more electric motors or traction motors for propulsion
2. Photovoltaics that serve as the structure's outer layer while also generating electricity
4. A measure of the average net present cost of electricity generation for a generating plant over its lifetime (two words)
5. Can be embedded into your t-shirts (two words)
7. Consist of several nodular micro-grids
11. decentralized group of electricity sources that are used to provide grid backup or off-grid power
13. Vehicle that uses two or more distinct types of power

