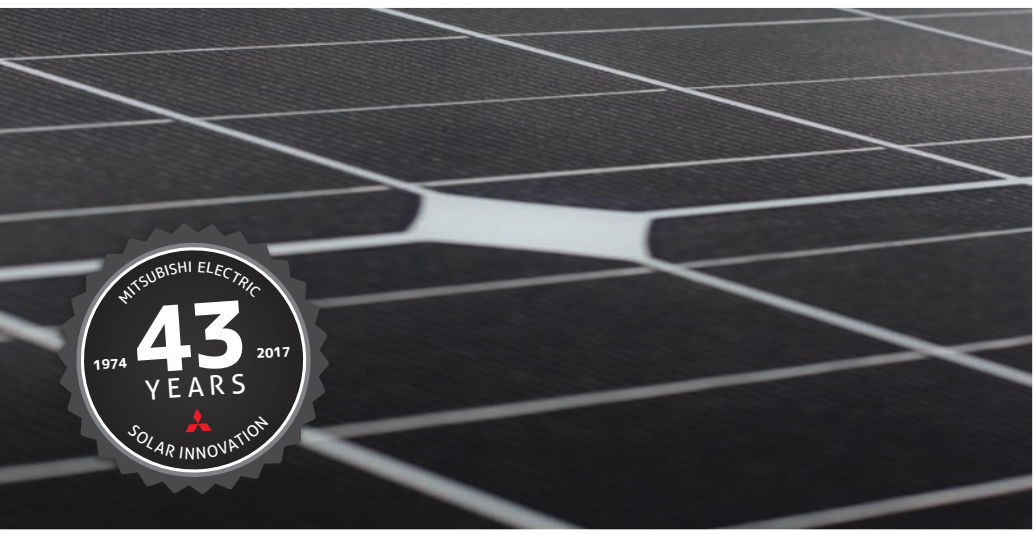
MITSUBISHI ELECTRIC

Black Diamond Solar PV Panels

Premium Monocrystalline Photovoltaic Panels



World Leaders in Photovoltaic Technology, backed by ongoing local support.

Why Choose Solar?

The time for solar is now. With power prices continuing to increase and the initial upfront cost of solar steadily decreasing, now is the perfect time to install Solar PV for an immediate and noticeable impact on your monthly power bill. It takes an average of only 7 to 10 years to recuperate upfront costs through electricity savings.

By slightly altering energy usage habits, for example by setting appliances to run during daytime hours, the payback period decreases even further. With an impressive output warranty of 25 years, installing a solar array is truly an investment in your future and can even increase the resale value of your home.

Why Choose Mitsubishi Electric?

The decision to purchase a Solar PV system is a long-term investment; one which should be made carefully by choosing a brand you can trust to be there for you in the long run. With over 40 years of manufacturing experience and innovation, Mitsubishi Black Diamond Solar PV Panels give you peace of mind that you are investing in one of the most reliable, high-quality systems engineered to stand the test of time.

You can have the unwavering confidence that Black Diamond Solar PV Panels from Mitsubishi Electric are made to last and are backed by local ongoing support for future years to come.

Made for NZ Conditions

Tailored to suit New Zealand conditions, Mitsubishi Black Diamond Solar PV Panels are of the highest quality and reliability, resulting in consistent top level performance.

Protect Your Investment!

At Mitsubishi Electric we understand that New Zealand has a unique environment, from city to sea. This rugged environment can damage solar panels due to high salt content in the air. Mitsubishi Black Diamond Solar PV Panels are coated with two layers of high quality anti-corrosion material, meaning they can be safely installed in coastal areas without harm.

High Loading

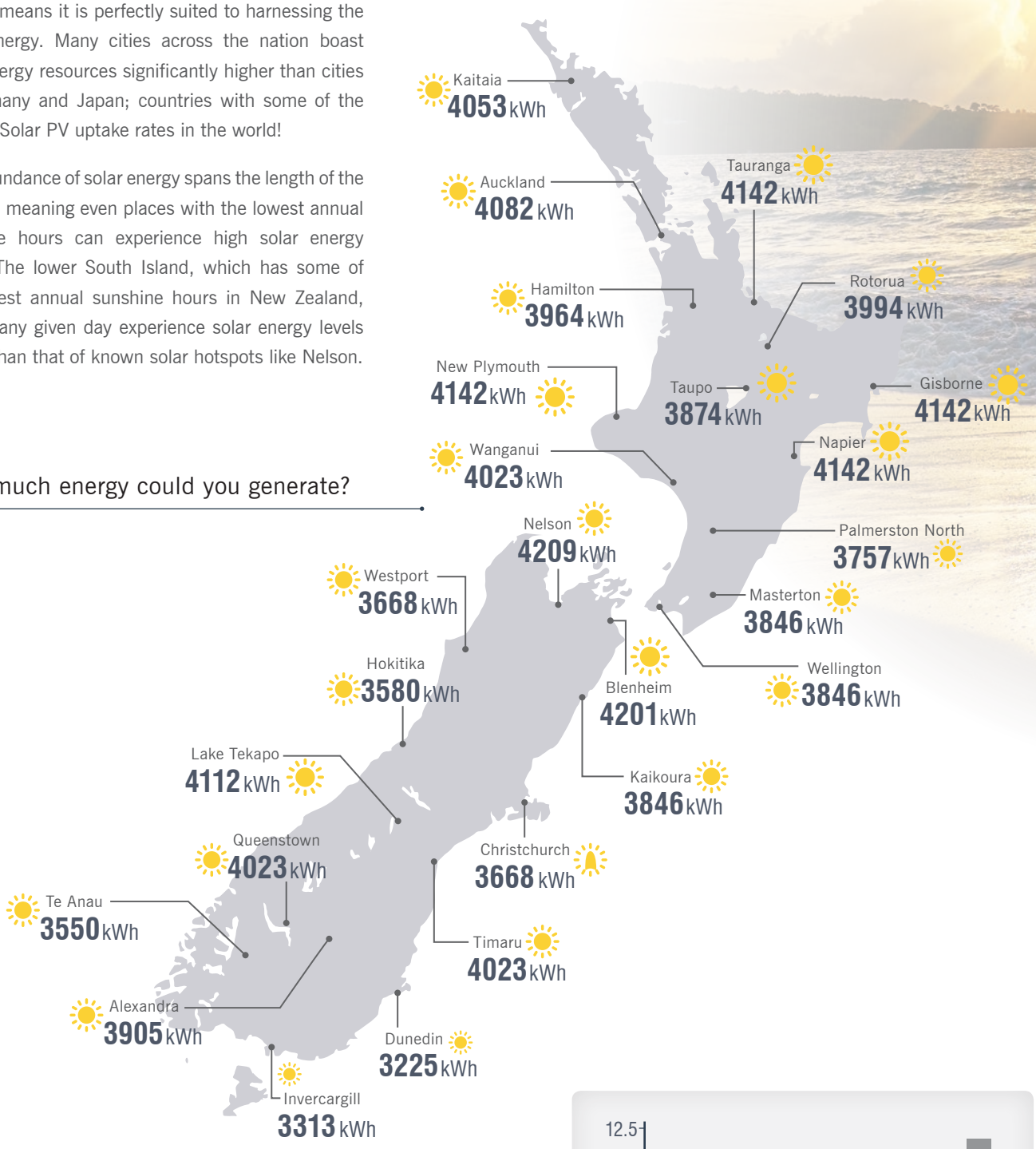
Mitsubishi Black Diamond Solar PV Panels have been designed to withstand harsh environmental conditions. The high structural strength of these panels has passed the IEC 61215 static loading test at 5400Pa, making them the perfect solution for areas that experience snow.

Abundant All Year Round

New Zealand's geographical landscape and temperate climate means it is perfectly suited to harnessing the sun's energy. Many cities across the nation boast solar energy resources significantly higher than cities in Germany and Japan; countries with some of the highest Solar PV uptake rates in the world!

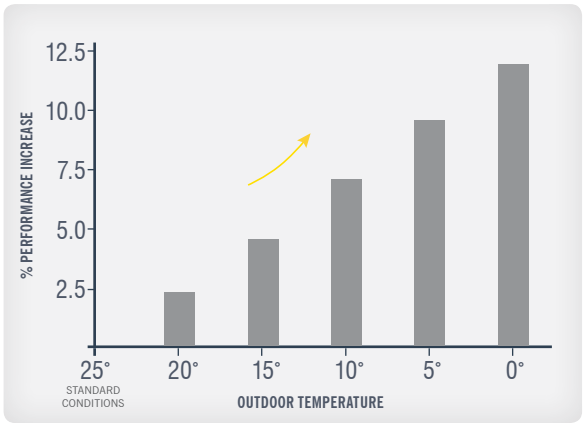
This abundance of solar energy spans the length of the country, meaning even places with the lowest annual sunshine hours can experience high solar energy levels. The lower South Island, which has some of the lowest annual sunshine hours in New Zealand, can on any given day experience solar energy levels higher than that of known solar hotspots like Nelson.

How much energy could you generate?



Enhanced Performance in Cool Temperatures

Alongside high levels of solar energy, New Zealand enjoys relatively low ambient temperatures year round. All Mitsubishi Black Diamond Solar PV Panels exhibit performance-enhancing characteristics. As a result, energy generation performance increases as outdoor temperatures fall,† meaning your Black Diamond Solar PV Panels are able to harness even more of the sun's indispensable energy.



† When subject to all other ambient conditions being identical.

*All kWh output figures expressed above are based on a 3.24kW Solar PV system and are estimates only, based on NIWA mean daily global radiation data for each city and surrounding area. Factors such as roof orientation, shading, buildings, trees, elevation and micro-climate can all affect energy generation. For an appraisal based on your specific location and environment, and to obtain a quotation for a Mitsubishi Black Diamond Solar PV array to suit your requirements please contact us so we can recommend a preferred PV Specialist in your region.

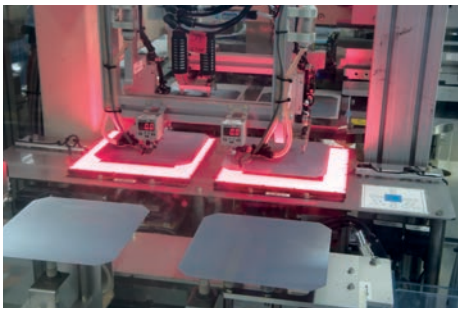
Quality You Can Trust

Mitsubishi Black Diamond Solar PV Panels are passed through the most stringent testing standards in the factory of our manufacturing facilities in Japan. Before being selected for use throughout New Zealand, our Solar PV Panels have gone through testing well beyond what is required by international standards.

As part of our quality control, each individual panel is marked with a unique identifiable barcode, tracking every step of its production.

Assembled on a state-of-the-art highly automated production line, Mitsubishi Black Diamond Solar PV Panels are examined by high-precision machinery, ensuring an unsurpassed level of uniformity. Every Solar PV cell produced is measured for its electrical characteristics, ensuring all cells are uniform and optimum performance is guaranteed.

Once complete, each panel's maximum output is recorded and only those which perform at or above their rated output are sent out the door for installation on roofs across New Zealand.

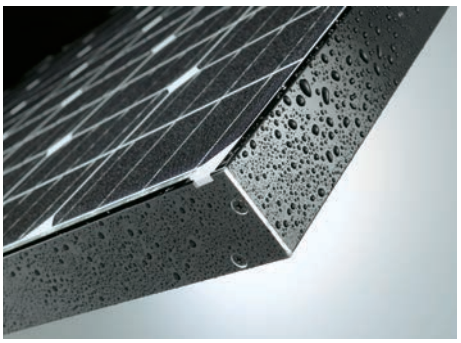


Premium Panels, Premium Output

All Mitsubishi Black Diamond Solar PV Panels produced for New Zealand homes are of the monocrystalline variety, offering many advantages to home and office owners.

Not only does the uniform black colour of our MLE range offer a sleek design which matches the colour of many roofs, monocrystalline panels are also more efficient*. This increased efficiency leads to increased energy generation, allowing you to maximise both your roof space and the return on your investment.

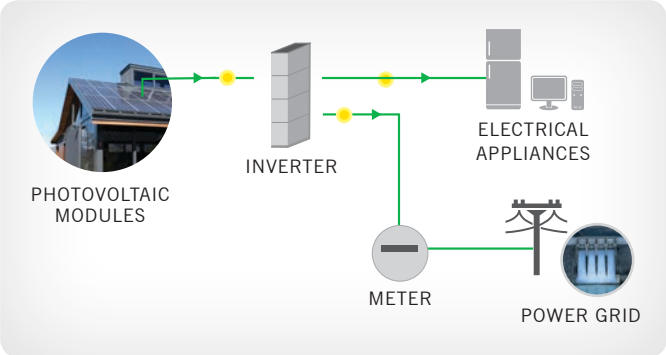
*Per m^2 when compared to polycrystalline panels identical physically in size, and subject to the same ambient conditions.



On or Off-Grid – a System to Suit Every Individual's Needs

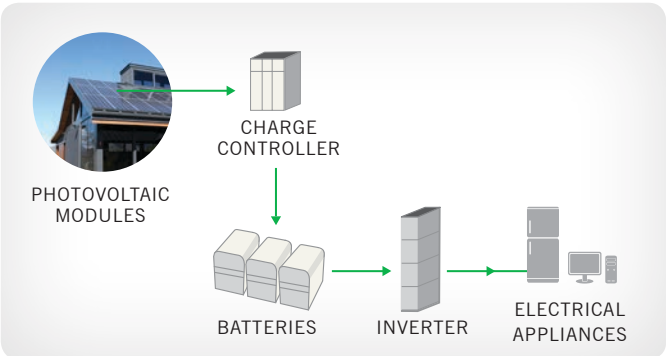
ON-GRID SYSTEM

The energy captured by the Mitsubishi Black Diamond Solar PV Panels is supplied to an inverter that converts this into AC power suitable for domestic or commercial use. This power is automatically directed to the household or building for use, and any surplus power is then exported to the grid and credited against the electricity bill.



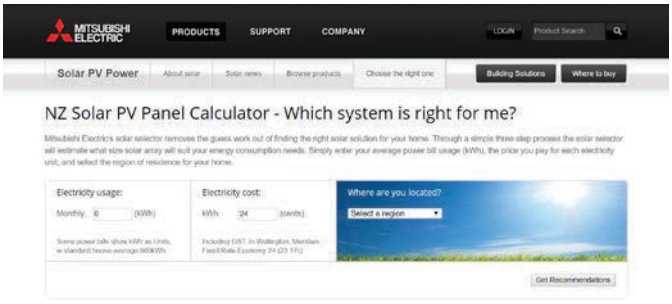
OFF-GRID SYSTEM

This system is ideal for consumers wanting to be completely self-sufficient. The energy captured by the Mitsubishi Black Diamond Solar PV Panels is supplied to a charge controller which maintains and charges the storage batteries. This is then converted by the inverter into AC power suitable for domestic use. The stored energy can be used to power different requirements within the house such as lighting and electrical appliances.



Which System is Right For You?

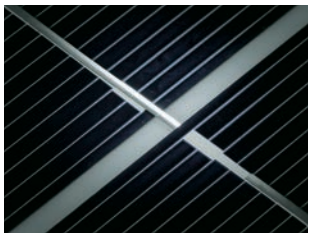
The Mitsubishi Electric Solar PV Selector removes the guesswork out of finding the right solar solution for you. As well as offering an estimate for two systems (to match 50% and as close to 100% of your needs), the Solar PV Selector also gives you an indication of what main components will be involved as well as on how much this system (excluding installation costs) is likely to cost. From here, we can arrange for one of our nationwide solar installers to contact you for a quote specifically tailored to meet your needs.



Visit **www.mitsubishi-electric.co.nz/solar** to find out which system suits your needs.

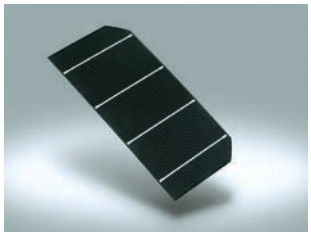
Leaders in Photovoltaic Technology

Mitsubishi Electric's philosophy in manufacturing photovoltaic products comes from three unwavering principles: superior technologies, the highest quality, and long-term reliability. Photovoltaic systems are a long-term investment, therefore no compromises should be made when choosing the right Solar PV product in order to avoid future problems. The Mitsubishi Electric difference lies in the small details that add up to provide outstanding performance.



FLEXI-CELL TAB WIRING

Flexible tab material has been developed to reduce physical stress on the cells caused by thermal fluctuations.

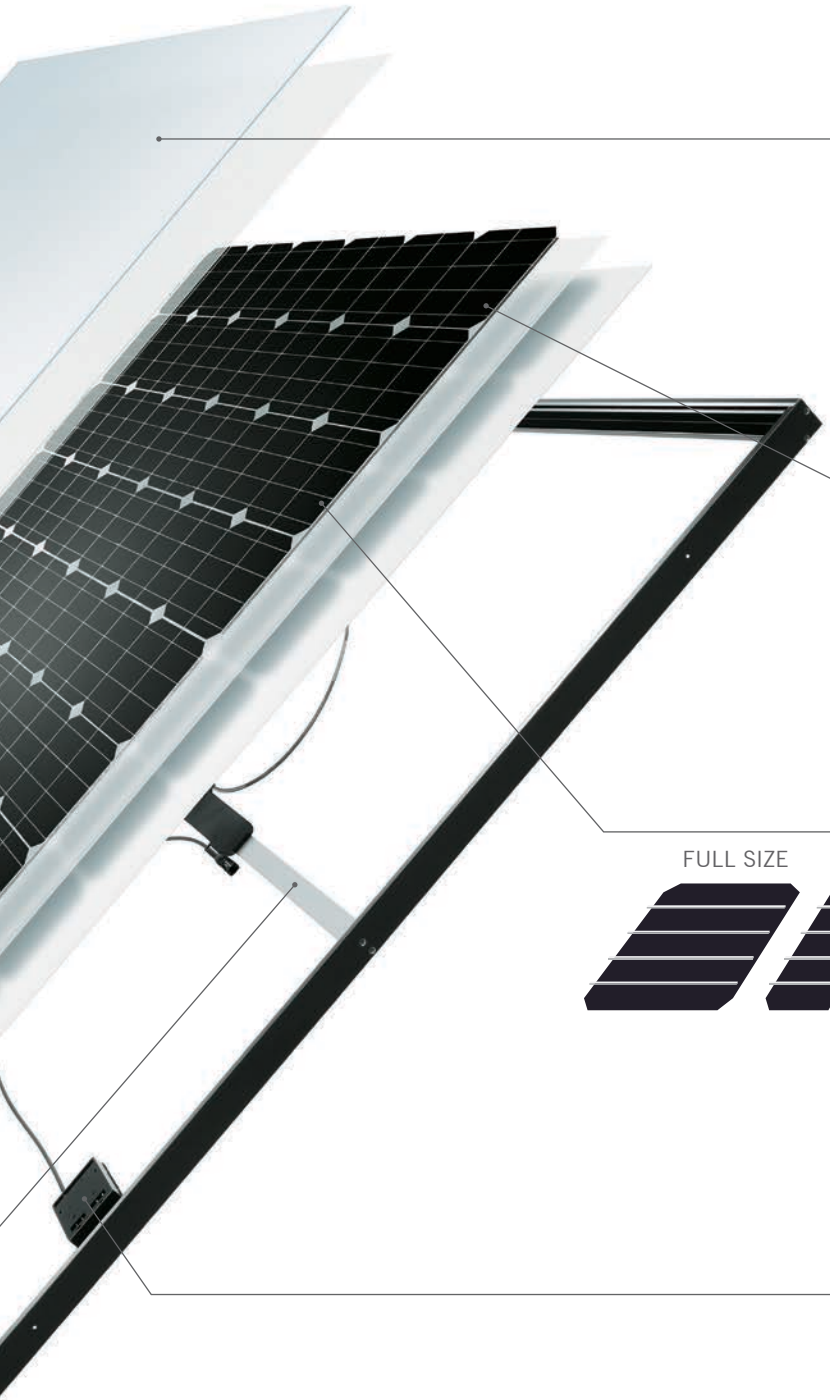


FOUR BUSBAR CELL

Through an industry leading innovation of integrating four busbars (conductive bars) into each cell, internal electrical resistance is reduced, boosting cell output by 3%.

L-FRAME DESIGN/PROTECTION BAR

The newly refined L-frame increases PV panel strength approximately twofold. Through using a smart protection bar insert, the structural strength of the panel is enhanced, enabling it to endure extreme environmental conditions.



ANTI-REFLECTIVE GLASS

Anti-reflective coating added to each panel improves light transmittance which in turn increases output by 2%.

SELECTIVE EMITTER

Introducing a new selective emitter process which allows Black Diamond Solar PV Panels to achieve a cell output increase of approximately 5%.

HALF-CUT CELL

Innovative half-cut cells reduce the electrical current carried by each busbar by half, decreasing electrical resistance and increasing overall efficiency by 2.5%.

NEWLY RE-DESIGNED JUNCTION BOX

Each junction box features a waterproof, flame-resistant four layer barrier of protection. Combined with heat-resistant diodes, an efficient heat-sink, and secured intertwining tab connections, these junction boxes boast a top-class level of safety.

CASE STUDY

Christchurch Residence

Energy efficiency is a key consideration for any home owner. This was no different for a Christchurch family setting out to build a 345m^2 home featuring the latest in Mitsubishi Electric heating and air conditioning. As a stay-at-home family they needed a solution that would ensure their energy usage was kept to a minimum throughout the day.

The family installed fourteen Mitsubishi Black Diamond Solar PV Panels, allowing a maximum system output of 3.64kWp. As an 'on-grid' system, the energy captured by the solar panels is supplied to an inverter, which converts it into power suitable for domestic use. This power is automatically directed to the household for use, and any surplus power is then exported to the grid and credited against the family's electricity bill.

The family chose an Enasolar 3kW Grid-Tied Inverter due to travel commitments. With built-in Wi-Fi as standard, they can access their Mitsubishi Black Diamond Solar PV array from anywhere worldwide. The inverter also has a simple-to-use monitoring program to track generation.

To help fund their dream home the family chose to switch their home mortgage to Kiwibank, and as such qualified for the Sustainable Energy Loan. This saw Kiwibank contribute almost 20% towards the investment cost of their array.

Within a year the family have already experienced savings which far exceed their initial expectations:

- The total savings over the first year totalled $1,126.07.
- Almost 5 megawatts of power was produced (4993kWh)!
- 51.2% of power generated was self-consumed at time of generation.
- The payback rate is estimated to be just over 7 years, and future increases in electricity prices will see this reduced further!

SOLAR PV PANELS

14 x PV-MLE260HD Premium Monocrystalline 260W Solar PV Panels

SOLAR INVERTERS

1 x ES-3.0kWGT-AUNZ - Enasolar 3kW Grid-tied Inverter

SYSTEM SIZE*

3.64 kWp

*Potential peak output at full sun

CASE STUDY

Garin College

For commercial buildings in New Zealand, the real cost of electricity can be tens of thousands of dollars every year. Garin College wanted to find an energy efficient solution that would make the most of the climate in sunny Nelson, and decided to install a 17.68kWp system to minimise their operating costs.

The New Zealand climate is ideal for maximising solar technology due to the high number of sunshine hours. Commercial buildings which operate during daytime hours have a great opportunity to self-consume energy at time of generation. This is the case for Garin College. With 100% self-consumption predicted during day time hours, it is expected that all of the power generated will be self-consumed, allowing them to truly maximise their investment and make significant cost savings.

The system is expected to produce around 23,000kWh per year, and within the first three months it produced a solid 8,900kWh – a fantastic result!

SOLAR PV PANELS

68 x PV-MLE260HD Premium Monocrystalline 260W Solar PV Panels

SOLAR INVERTERS

1 x STP17000TL SMA Sunny Tripower 3 phase Grid-tied Inverter

SYSTEM SIZE*

17.68kWp

CASE STUDY SUPPLIED BY:

freedom energy

*Potential peak output at full sun

CASE STUDY

Queenstown Residence

A secluded house in the Queenstown district features one of the most picturesque photovoltaic (PV) installations in New Zealand. The system is rated at an impressive 21.6kWp with the install split between the roof of the house and a ground-mount system.

Mitsubishi Black Diamond Solar PV Panels are manufactured to provide high efficiency. The higher the efficiency of each panel the more power produced, ultimately reducing the number of panels required for installation. The amount of power required from a PV array will dictate the overall size of the installation in terms of the number of panels required. This particular project combines 120 PV panels; therefore some consideration was given to how they would be fitted to the residence.

Installing a back-up system gave the residence complete control. Whilst operating off-grid, the system is capable of producing enough energy to power the entire house, with any excess power stored in batteries. When operating on-grid this large scale array can be set up to provide a portion of the overall power usage which is fed back to the grid during off-peak times (i.e. during the day or periods of low demand). This means the grid itself effectively becomes storage, all whilst offsetting the household's overall electricity costs.

SOLAR PV PANELS

120 x PV-AD180MF5 180W Polycrystalline PV Panels

SYSTEM SIZE*

21.6 kWp

*Potential peak output at full sun

CASE STUDY

Black Diamond Technologies Limited Head Office

For many commercial businesses in New Zealand the real cost of electricity can be tens of thousands of dollars every year. With an annual energy usage of over 392MW (392,000kWh), Black Diamond Technologies Ltd (BDT) was no different.

As exclusive distributors of Mitsubishi Electric product, BDT was already distributing premium quality Mitsubishi Electric Black Diamond Solar PV Panels in New Zealand, so did not need to look far to find a solution to decreasing energy costs.

BDT understood that the principles applicable to residential Solar PV remain fundamental to commercial installations. Any energy generated by solar panels installed on the BDT Head Office would automatically be directed for use within the company first before surplus power is exported to the grid and credited against BDT's electricity bill. And as is the case with many commercial businesses, BDT consumes a majority of their power during the day, to which Solar PV lends itself suitably.

After complete assessment of BDT's load profile, a 30.68kWp array consisting of 118 Mitsubishi Electric Black Diamond Solar PV Panels was designed. In matching BDT's energy consumption with the potential energy generation, this system ensures any energy generated during periods of internal peak demand will be self-consumed.

In total, BDT's Head Office solar array is estimated to generate 34,270kWh per year. The system is designed for maximum self-consumption and has the potential to provide 25.12% worth of savings on daily operational energy requirements. BDT is also proud to report an estimated annual CO^2 reduction of 16.4 tonne.

SOLAR PV PANELS

118 x PV-MLE260HD Premium Monocrystalline 260W Solar PV Panels

SOLAR INVERTERS

2 x SMASTP10000TL – SMA Sunny Tripower 10000TL Inverters
2 x ES-5.0kWGT-AUNZ - Enasolar 5kW Grid-tied Inverters

SYSTEM SIZE*

30.68 kWp

*Potential peak output at full sun

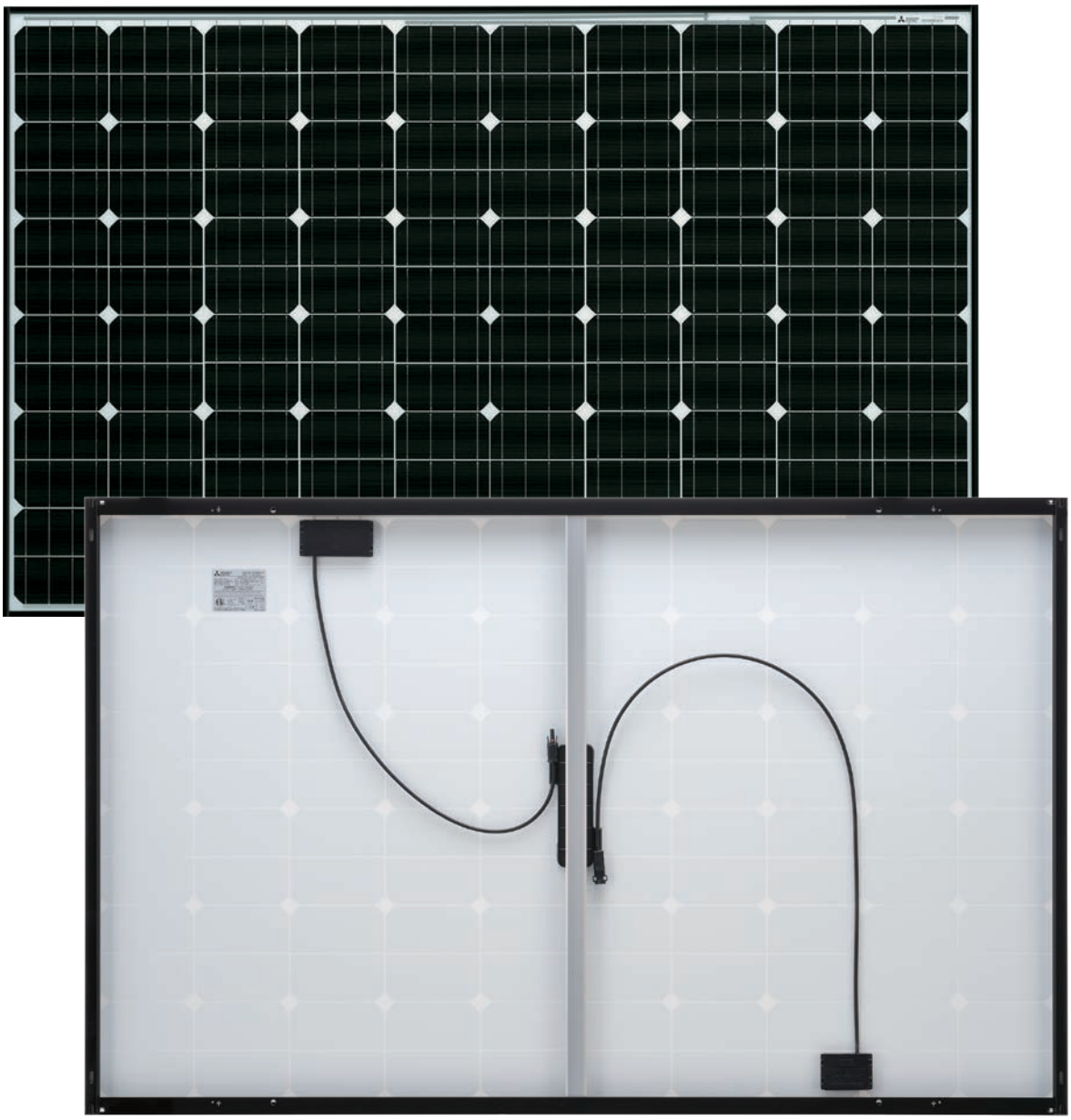
Black Diamond Solar PV Panels **(MLE Series)**

Introducing our high performance monocrystalline PV module line up with 4 busbar cell technology

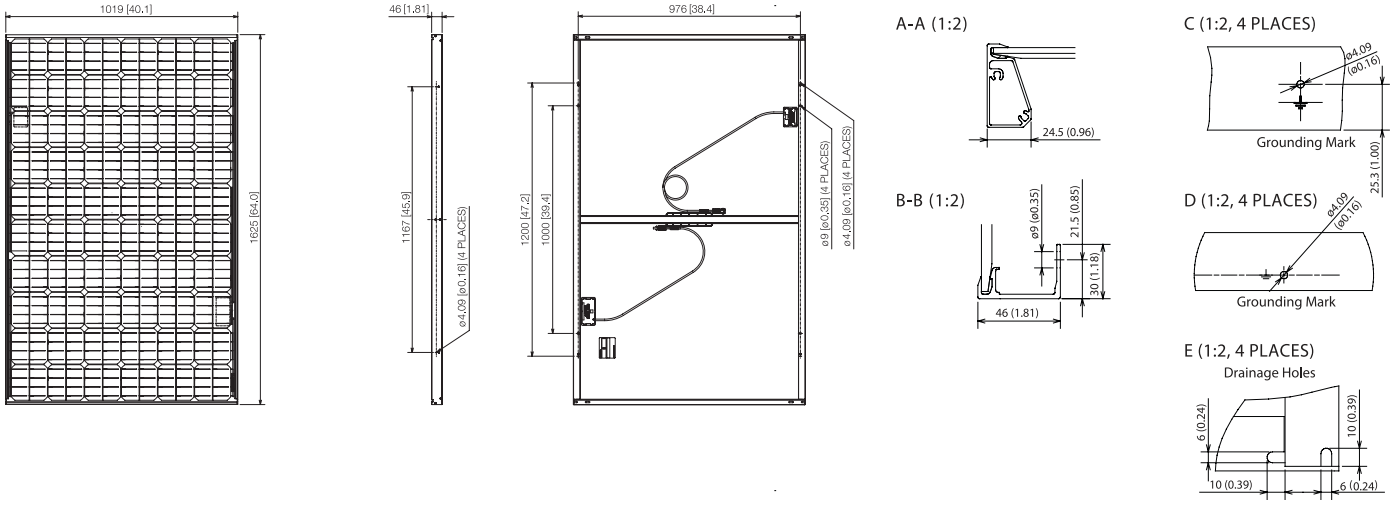
Unlike polycrystalline cells, monocrystalline photovoltaic cells are manufactured from one silicon crystal, making them more efficient per square metre and more uniform in colour. Mitsubishi Electric's new premium generation of monocrystalline photovoltaic panels continue to integrate industry leading innovation.

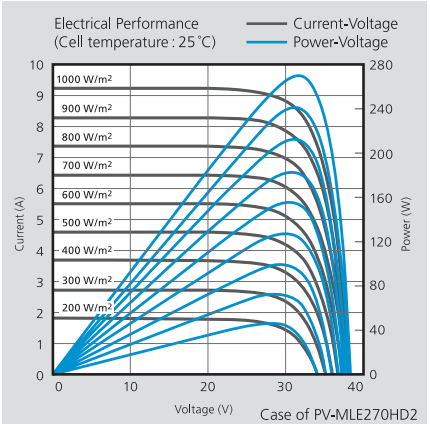
PV-MLE SERIES

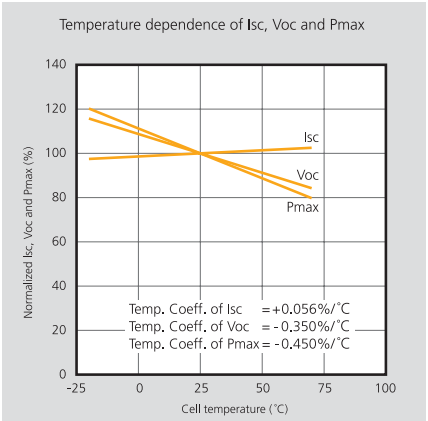
Our premium model featuring half-cut cell technology.
Ideal for residential and smaller commercial systems.

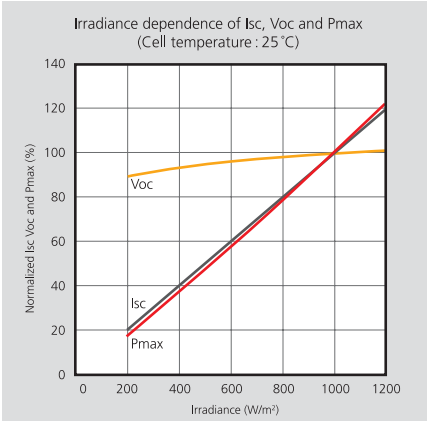


MODEL NAME	PV-MLE270HD2	PV-MLE280HD2
Cell Type	Monocrystalline silicon, 78mm x 156mm	
Number of Cells	120 cells	
Maximum Power Rating (Pmax)	270W	280W
Warranted Minimum Pmax	270.0W	280.0W
Tolerance of Maximum Power Rating	-0/+5%	
Open Circuit Voltage (Voc)	38.4V	38.6V
Short Circuit Current (Isc)	9.18A	9.37A
Maximum Power Voltage (Vmp)	31.9V	32.4V
Maximum Power Current (Imp)	8.48A	8.68A
Normal Operating Cell Temperature	46.5°C	
Maximum System Voltage	1000V	
Fuse Rating	15A	
Dimensions	1625x1019x46mm	
Weight	20kgs	
Output Terminal	(+) 800mm/(-) 1250mm with SMK (PV-03) connector	
Panel Efficiency	16.3%	16.9%
Packaging Condition	2 pcs/1 carton	
Certificates	IEC 61215 2nd ed., IEC 61730, UL 1703	
Output Warranty	93% of rated minimum Pmax for 10 years	
	80% of rated minimum Pmax for 25 years	









Black Diamond Solar PV Panels **(MJE Series)**

PV-MJE SERIES

Our high-efficiency pro model. Suited for commercial and utility-scale systems.

Quality/Warranty Assurance

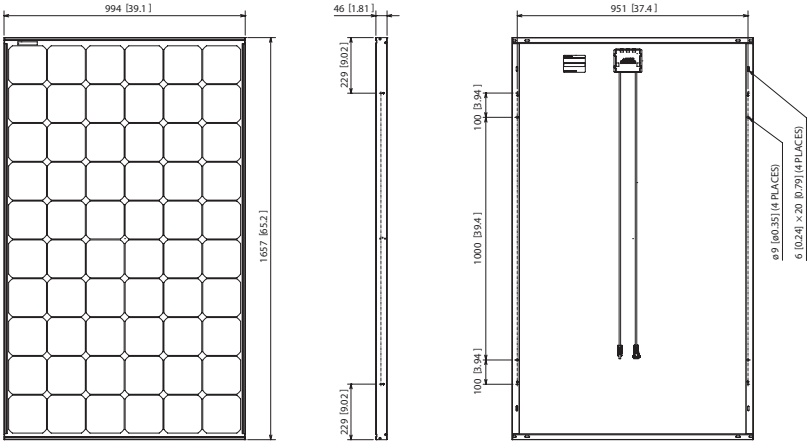
PREMIUM **25 YEAR** OUTPUT WARRANTY

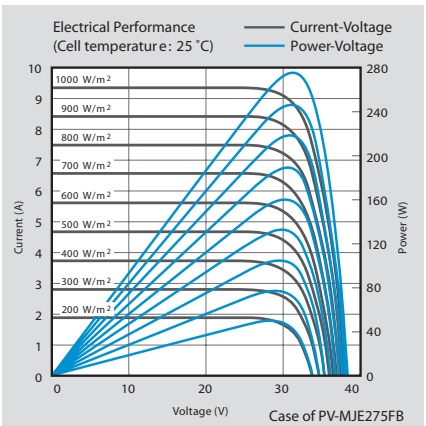
10 YEAR PRODUCT WARRANTY

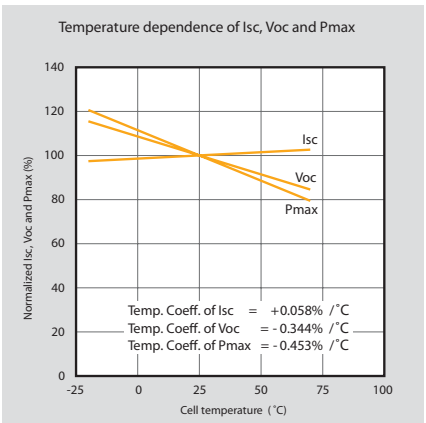
With unwavering confidence in the quality of our products and meticulous confirmation of real-world performance data, all Mitsubishi Black Diamond Solar PV Panels carry a 25 year output warranty. This guarantees at least 93% output of the name plate rating for the first 10 years and 80% for 15 years thereafter.

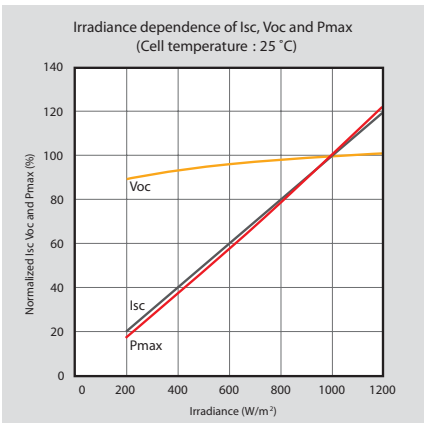
And with every panel produced bearing the Mitsubishi Electric stamp of approval, Mitsubishi Black Diamond Solar PV Panels allow you to take comfort that your 25 year warranty is backed by one of the most reliable companies in the world.

MODEL NAME	PV-MJE270FB	PV-MJE275FB
Cell Type	Monocrystalline silicon, 156.75mm × 156.75mm	
Number of Cells	60 cells	
Maximum Power Rating (Pmax)	270W	275W
Warranted Minimum Pmax	270.0W	275.0W
Tolerance of Maximum Power Rating	-0/+5%	
Open Circuit Voltage (Voc)	38.2V	38.3V
Short Circuit Current (Isc)	9.23A	9.36A
Maximum Power Voltage (Vmp)	31.1V	31.3V
Maximum Power Current (Imp)	8.69A	8.79A
Normal Operating Cell Temperature	46.0℃	
Maximum System Voltage	1000V	
Fuse Rating	15A	
Dimensions	1657x994x46mm	
Weight	19kgs	
Output Terminal	(+) 1175mm / (-) 1175mm with SMK connector (PV-03)	
Panel Efficiency	16.4%	16.7%
Packaging Condition	2 pcs/1 carton	
Certificates	IEC 61215 2nd ed., IEC 61730, UL 1703	
Output Warranty	93% of rated minimum Pmax for 10 years	
	80% of rated minimum Pmax for 25 years	









MITSUBISHI ELECTRIC
www.mitsubishi-electric.co.nz

Black Diamond Technologies
Exclusive distributor of Mitsubishi Electric products in New Zealand.

WELLINGTON
HEAD OFFICE

1 Parliament Street
PO Box 30772
Lower Hutt 5040

Phone (04) 560 9147
Fax (04) 560 9133

AUCKLAND
BRANCH

Unit 1, 4 Walls Road
PO Box 12726
Penrose, Auckland 1642

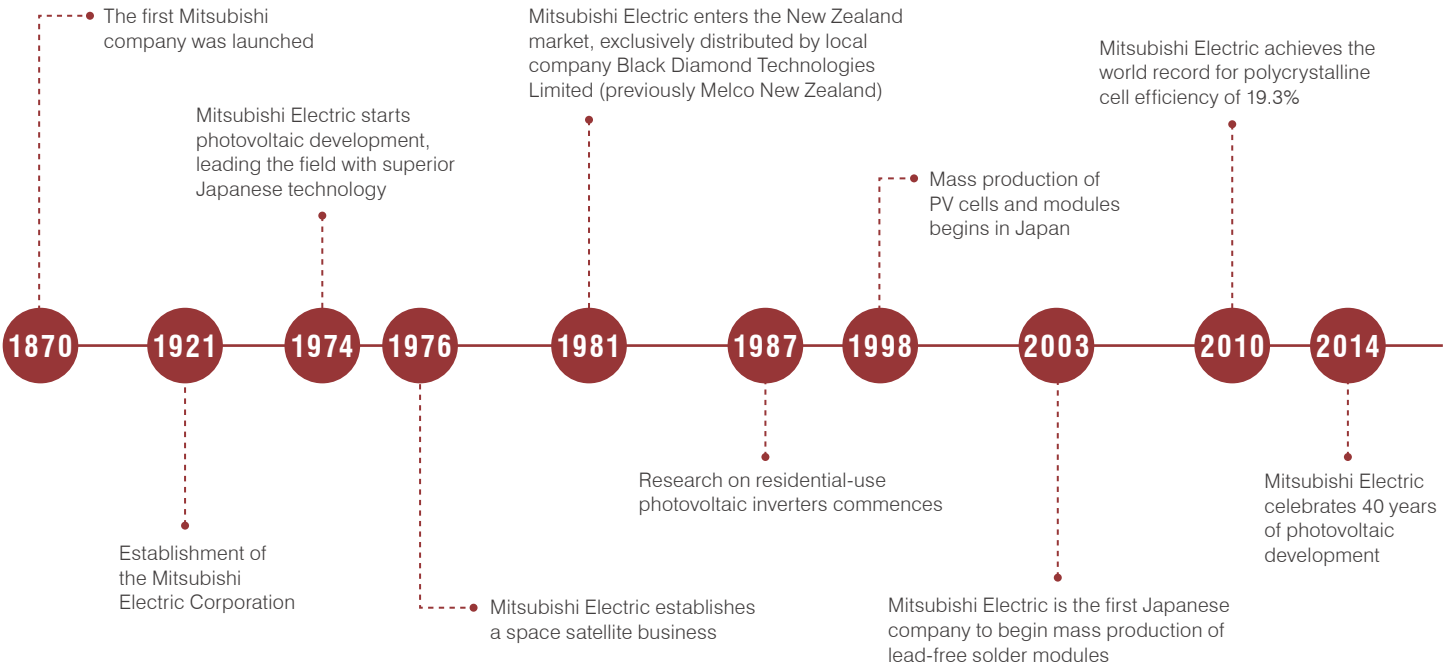
Phone (09) 526 9347
Fax (09) 526 9369

CHRISTCHURCH
BRANCH

44 Halwyn Drive
PO Box 16904
Hornby, Christchurch 8441

Phone (03) 341 2837
Fax (03) 341 2838

History of Mitsubishi Electric



All Mitsubishi Black Diamond Solar PV Panels carry a 25 year output warranty* and a 10 year product warranty that is locally backed.

*93% of rated minimum Pmax for 10 years, 80% of rated minimum Pmax for 25 years

For more information on Mitsubishi Black Diamond Solar PV Panels, please call our customer service team on **0800 784 382**