PPA

A PACIFIC POWER ASSOCIATION PUBLICATION

Falemasiva Hall Nukualofa, Tonga venue of the PPA Conference 2024

VOLUME 32 ISSUE 2 - JUNE 2024

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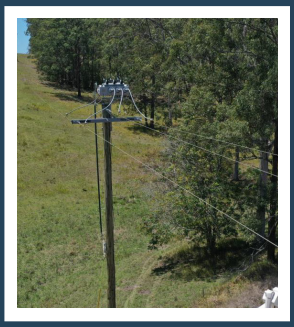

PPA

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Gordon Chang

Pacific Power Association, Suva, Fiji Islands. The PPA is an inter-governmental agency and member of the Council of Regional Organisations in the Pacific (CROP) established to promote the direct cooperation of the Pacific Island Power Utilities in technical training, exchange of information, sharing of senior managment and engineering expertise and other activities of benefit to the members.

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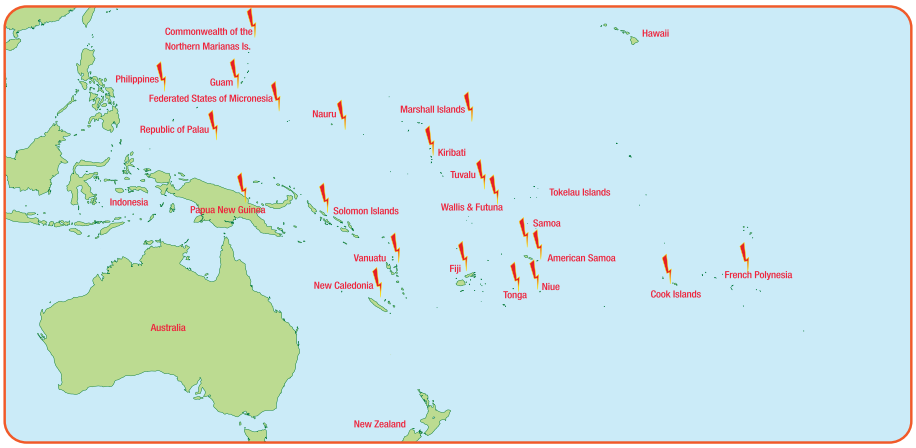

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Editor's Note

Gordon Chang
Executive Director

It is now "full steam ahead" for our fast approaching 31st Annual PPA Conference to be held in Nuku'alofa, Tonga. All indications are that the host, Tonga Power Ltd, has all their preparations almost completed. This will certainly be a Conference conducted in true Pacific Island style. This year's conference theme is "Cost of Transition to Renewables". I urge all members to urgently consider reserving your accommodation soonest as rooms are being reserved by other visitors to Tonga.

Our Association has begun implementation of the new Benchmarking Project funded by the ADB. The contract for this project has been awarded to HINFRASTRUCTURE LLC, one of the PPA allied members to start the project with all the PPA member utilities. The PPA Secretariat is requesting all utilities to start collecting their data from 2022 and 2023 so the contractor can work on the yearly reports for these years. The Power Factory software project will soon begin with the utilities that is using this software in their utility. This project is being funded by the World Bank out of the remaining funds from SEIDP that was closed in February 2022.

The PPA Secretariat would like to welcome all our new allied members who joined as financial members in this last quarter and look forward to catching with you at the PPA Conference in Tonga. For those members who have withdrawn their membership, I look forward to seeing you come back as financial members soon.

Allied Membership updates for April – June 2024 as follows:

New Members:

1. Star Bright Energy (Fiji) Ltd
2. Palladium International Pty Ltd
3. Energy Pool Development
4. Syntell Co.
5. ECOSUN Innovations
6. Tesla Inc.
7. Eigigu Procurement

Withdrawn Members:

1. Cables Fiji Ltd
2. HNAC Technology Co. Ltd
3. Solar Hub
4. Stamford AvK

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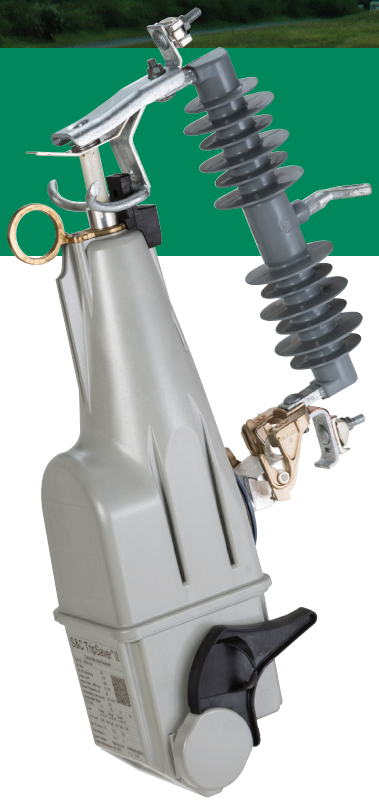

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Improving Electrical Switching Safety In The Resources Industry

NOJA Power

Switching Operations are essential for the reliability and functioning of electrical distribution grid. Networks which serve the resources industry, such as Mining or Oil and Gas networks bring added risks to the operations.

These industrial environments provide challenging operating conditions for electrical switchgear, where pollution buildup and high risk work environments can increase safety risks for operators.

However, these added risks are not unnoticed, and recent developments in electrical switchgear technology brings mitigations for these environmental risks, allowing resources operations to reduce downtime or frequency of workplace incidents.

The Operating Environment

Supplying power to assets on a resource site is a fundamental constraint of resource extraction. Processing plant or electrical excavation machinery does not generate revenue when it isn't powered up.

These applications require reliable power, but the added high pollution environment increases the need for frequent maintenance. De-energisation of assets for maintenance access becomes routine in the reliable operation of a resource extraction enterprise.

This added pollution environment adds risk for traditional electrical switching equipment, or "Switchgear".

Buildup of materials such as iron ore dust on legacy exposed air break switches can cause a degradation in performance or reliability.

While older designs of enclosed SF6 based load break switches mitigates the impact to isolation points, the industry ambition of carbon reduction is not compatible with using SF6 switchgear at the medium voltage distribution level.

Fortunately, advances in solid dielectric insulation technology can offer a load break switch system which has zero SF6, but encloses the isolator for improved reliability performance in polluted environments.

How to improve electrical switching safety in resource extraction sites

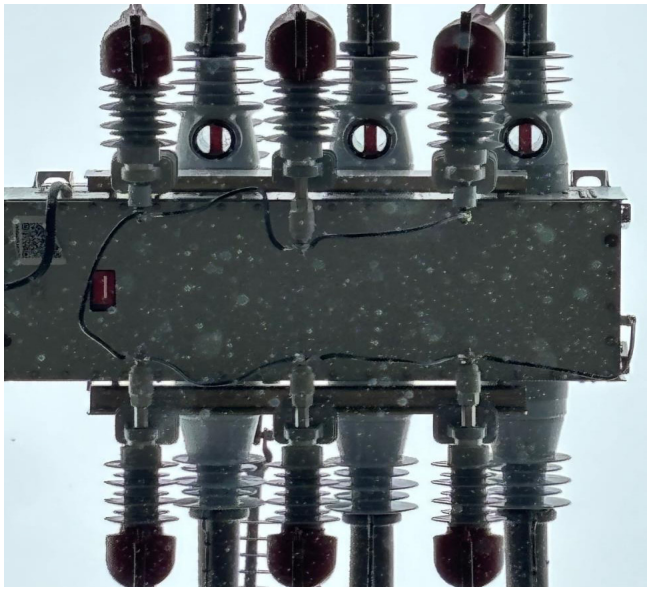
One technique is to employ solid dielectric switchgear, rather than legacy air-break or SF6 insulated devices.

A NOJA Power VISI-SWITCH® installed on a feeder in Australia.

Medium voltage distribution switchgear such as the NOJA Power VISI-SWITCH® use a solid dielectric insulation scheme and enclose the isolation gap. This device also includes a viewing window for the isolation gap, affording operators the ability to confirm isolator position onsite, while greatly reducing the risk of pollution interfering with electrical performance.

This device also includes provisions for padlock style interlocking, making the equipment compatible with existing resources energy distribution works practices.

Deploying solid dielectric load break switches with an enclosed visible break offers a significant improvement to electrical switchgear safety, while also addressing decarbonisation objectives of the industry. Furthermore, these technology advancements in both safety and sustainability deliver a positive outcome for social license to operate.



A NOJA Power VISI-SWITCH® viewed from below. Note the visible enclosed isolators.

Conclusion

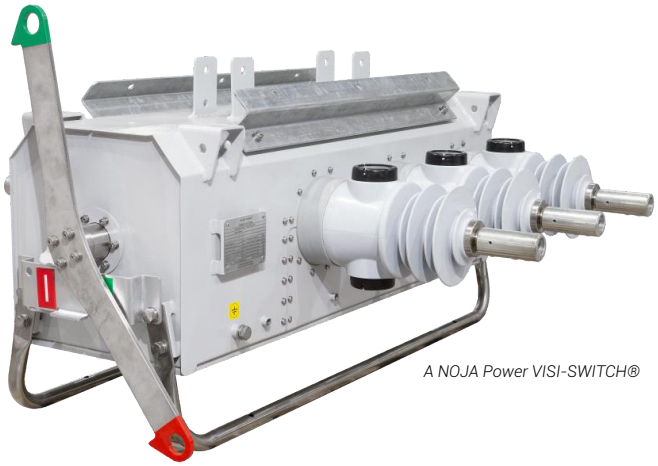
"The NOJA Power VISI-SWITCH® allows our customers to buy a reliable enclosed load break switch that completely eliminates the use of SF6 gas and gives back operators the visible break they lost when open air-break switches stopped being used on distribution networks," says NOJA Power Group Managing Director Neil O'Sullivan.

While resources industry applications accumulate additional operational risks, improvements in switchgear technology provide technical mitigations for the added risk.
Using enclosed solid dielectric load break switches provides an improvement in both safety and sustainability.
For more information visit www.nojapower.com.au

About NOJA Power

Founded in 2002 in Brisbane Australia, NOJA Power is a switchgear engineering company that has grown to serve over 104 countries from their Brisbane manufacturing headquarters. The company develops safe, environmentally friendly medium voltage equipment, such as the OSM Recloser, GMK Ground Mount Kiosk Circuit breaker and NOJA Power VISI-SWITCH® Load Break Switch.

These products are used to protect and control the distribution grid, serving in applications such as overhead lines protection, renewable and distributed energy integration and medium voltage private infrastructure protection.

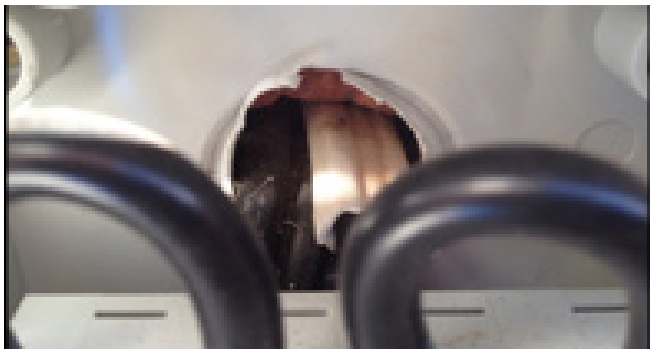


A NOJA Power VISI-SWITCH®

Solar Installation : Common Mistakes And Best Practices

SEIAPI March Newsletter

GSES has been part of the Clean Energy Regulator's inspection program for many years and has seen all sorts of good, bad and ugly systems. This article will explore the most common issues found during our inspections and how to improve installations so that installers can rest easy knowing that they won't have compliance issues but also that their customers are happy and safe.



ROOFING PENETRATIONS

Where the PV array cable and conduit passes through a tile or steel roof, a fit for purpose collar flashing, such as dektite should be installed.

IMPROPER ROOFING PENETRATIONS

In this instance below, we can see that the cabling is passing through a tin roof, however no dektite or flashing is installed. This improper installation could lead to water ingress into components and can cause severe damage to the system and surrounding components. To correct this, the installer must reinstall using a dektite (or similar) and a UV stabilised sealant. Adding additional silicone to the penetration will ensure that it provides a waterproof seal. The installer should also install a suitable cable gland on the end of the conduit leading to the roof penetration to avoid this issue.

CORRECT ROOFING PENETRATIONS

The below image illustrates the correct utilisation of dektites and flashing for roof penetrations in a rooftop PV system. The system is fully sealed against water ingress, ensuring the longevity of the system.

EARTHING LUGS AND WEEBS

Proper design and installation of the earthing system is crucial to the system's operation. Earth faults can pose several risks to the system and to people around it including: electric shock, fire hazard, damage of other components, and voltage drops that lead to reduce performance.

Earthing lugs and WEEBs must be used to connect the equipment to the earth. It is also important to use an anti-corrosion spray on the lug to avoid it corroding.

IMPROPER EARTHING

In the image below right, a WEEB is not correctly installed which risks the grounding of relevant panels. The WEEB should be attached firmly on the panel to ensure that it bears the electrical current.

The image below left, an earthing lug is sprayed, but it is in contact with the panel surface itself. This could potentially cause a short circuit and even hotspots to appear on the panel, severely damaging the system and harming performance.

PROPER EARTHING

A well-earthed system has every module earthed. Importantly, removing a module won't compromise the earthing of any other module. All lugs and WEEBs should be installed as per manufacturer specifications and should be protected from moisture using anti-corrosion coating.

We recommend using earthing (WEEB) washers with all mid clamps to ensure that none are missed. It is also important to be careful when laying the modules as the metal frame can scratch the WEEB washer and make it less efficient when conducting currents.

CABLING AND CONNECTORS

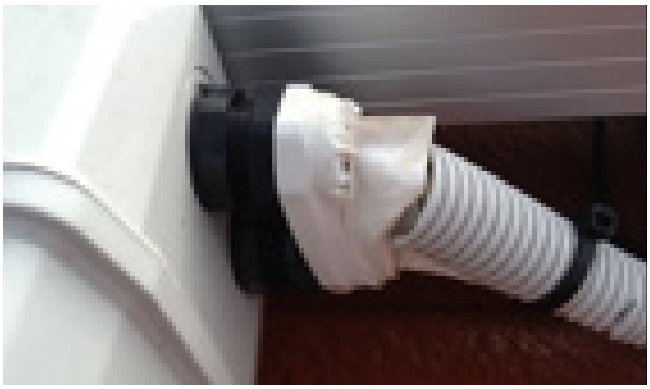
Improper cabling terminations and connectors are a common point of failure for PV systems. Cabling should be installed with sufficient conduit protection, and appropriate glands. A multi-hole gland shouldn't be used for a single cable if it means leaving a hole exposed.

The connectors between the panels must always be of the same make and model to ensure a perfect fit. Connectors that do not match have a high risk of coming apart, possibly leading to dust and water ingress, which can cause faults on the system and arcs to form.

IMPROPER CABLING

The image below demonstrates an improper connection between a conduit and a gland, leaving the potential for water ingress into the conduit. Even with an appropriate drain at the lowest point in the conduit the exposed cabling poses a risk.

This image has no conduit at all, leaving the cabling itself hanging loose and exposed to the elements.



PROPER CABLING

A good cabling will be organised, sealed, labelled and well-terminated. Some good practices include ensuring that:

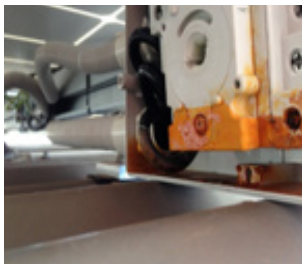
- The conduit is labelled every couple of meters
- Drains are installed at the lowest point of conduits, and their lowest point isn't the switchboard or any sort of conductor termination
- Module cabling on the roof isn't loose and isn't resting on the roof surface
- New holes haven't been drilled into enclosures, even the bottom. This is a common mistake that compromises the weather resistance of an enclosure
- There aren't more cables run through the gland than holes provided in the gland, and spare holes are sealed with a manufacturer-provided plug

ISOLATORS

Isolators should be installed in accordance with the relevant manufacturer guidelines, their relevant ratings and in accordance with AS/NZS 5033:2021.

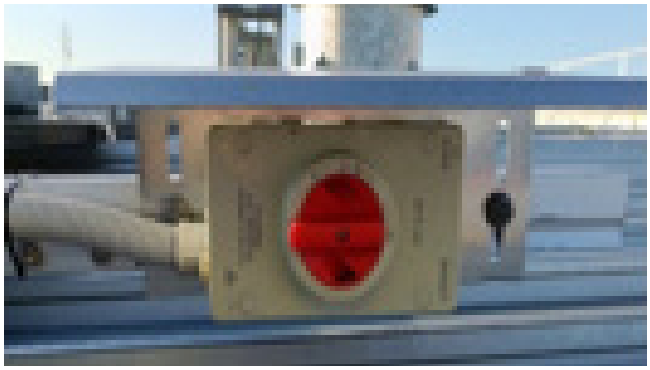
IMPROPER ISOLATOR INSTALLATION

Failure to do so can result in water ingress, even if the isolator is located under the panel like in the image below. Water ingress could lead to failure of the components, and in worse cases cause fires that can damage the entire system. Installers should also check the seals between the isolator and conduit – the isolator entry shouldn't be the lowest point of the conduit as this could result in water ingress. The isolator should also be properly resealed after removing the cover when installing the system.



PROPER ISOLATOR INSTALLATION

A good (and compliant!) isolator installation is in the shade (often beneath panels, but a cover as described in AS/NZS 5033 is also acceptable) with precautions taken to prevent weather ingress. It needs to be easily accessible and well labelled. The below is an example of a correctly installed isolator.

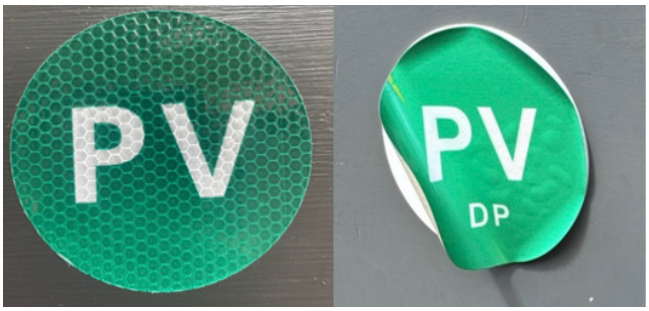


SIGNAGE

It's easy to think signage isn't necessary, but it's very important not just for residents, but also for the next tradespeople at site and emergency services. A PV reflector clearly signals the presence of a system to isolate if necessary, and a DC cabling warning placed as required by relevant standards could prevent a bad accident for anyone working in the roof space.

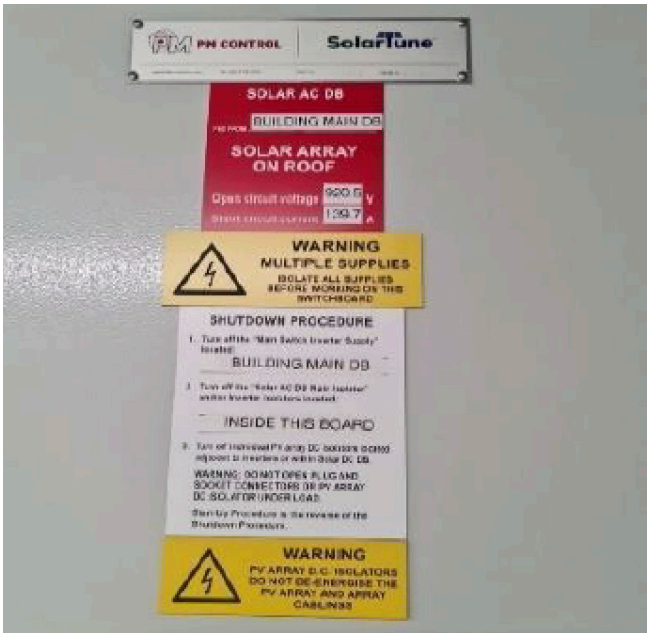
IMPROPER SIGNAGE

The 70mm green PV reflectors commonly sold do not meet the requirements set out in AS/NZS 5033:2021 5.4. The below left reflector is missing an indicator of isolation method (e.g. "DP"). The reflector on the right cannot be expected to last the lifetime of the system, and would require a replacement from the installer very quickly.



PROPER SIGNAGE

There's a lot of signage that's required in Australia, and it can broadly be found in the up-to-date editions of AS/NZS 5033, AS/NZS 4777 and AS/NZS 3000. It's also a very common area where installers are pulled up. Whether it's the neutral wire being unlabelled in the switchboard, disconnection point indicators being in the wrong place or the site plan missing key information such as the address, there's a lot to keep track of. However, an exemplar system will have all signage necessary which will ensure any future work on or nearby the system is as safe as possible. The below picture is an example of good signage.



INVERTER INSTALLATION LOCATION

The inverter should be installed in an appropriate location for its IP rating and should not be exposed to direct sunlight for the majority of the day. Installation in a spot exposed to direct sunlight would result in a faster degradation of the inverter to the point where water resistance could be compromised or maintenance can't be performed without damaging the enclosure. The inverter should be installed in a well-ventilated area, away from direct sunlight as indicated in the picture below.

CONCLUSION

When shortcuts are taken in solar installation, things can get ugly quickly. Whether this is just needing to replace a component or widespread ceiling damage from an improperly sealed roof, avoidable repairs and replacements are costly and compromise the efficiency and longevity of systems. Repeated issues with installations can also risk the loss of accreditation, so being rigorous on your installation practices is critical, saving you time, money and reputation in the long run.

Pacific Trade Invest Support Hydrogen Power Fiji To Develop Its First Green Hydrogen Power Plant Project In The Pacific

Inge Van Soom, Communication Manager
HDF Energy

Pacific Trade Invest, the Pacific region's lead trade and investment promotion agency, announces its support to Hydrogen Power Fiji, a subsidiary of HDF Energy, a leading developer of large-scale green hydrogen infrastructure and high-power fuel cell manufacturer. This collaboration is focused on advancing the development of the inaugural Renewstable® hydrogen power plant project by Hydrogen Power Fiji on Viti Levu, Fiji's largest island.

Renewstable® power plants, pioneered by HDF Energy, signify a groundbreaking advancement in renewable energy solutions. By seamlessly integrating intermittent renewable energy sources, like wind or solar, with substantial on-site energy storage in the form of green hydrogen, Renewstable® plants deliver non-intermittent, stable, and baseload power, around the clock.

This innovative approach presents the green alternative to imported and costly heavy fuel oil, thus ensuring Fiji's energy independence and reducing its trade deficit. In addition, it will help boost the local economy, creating local jobs and skills.

The project aligns perfectly with the Fijian government's ambitious target of achieving 100% green electricity by 2034 and reducing emissions by 30% by 2030.

Furthermore, it sets the stage for the creation of a hydrogen ecosystem, with future prospects including addressing the maritime market, catering to rural communities, and serving island resorts.

David Clement, VP Oceania of HDF Energy, stated: *"We are honoured to receive support from Pacific Trade Invest to introduce our Renewstable® technology to Fiji. This collaboration not only underscores the confidence that Pacific Trade Invest has in our solution but also sets a precedent for similar projects across the Pacific Islands."*

HDF Energy aims to replicate the success of the Renewstable® project in other Pacific Islands, driving a wave of positive change towards a greener and more resilient future for the entire region.

ABOUT HDF ENERGY

HDF Energy is a leading global player in the hydrogen industry, dedicated to developing large-scale hydrogen infrastructure and advanced multi-megawatt fuel cell technology.

These fuel cells generate electricity from hydrogen, driving the decarbonization efforts across the power generation, heavy maritime and rail mobility sectors. Set to commence mass production in 2025 at HDF Energy's facility near Bordeaux, these fuel cells serve as the cornerstone of the power plants and heavy mobility solutions developed by HDF Energy.

HDF Energy's Renewstable® power plants deliver non-intermittent renewable, stable and baseload power by seamlessly integrating intermittent renewable energy sources with substantial on-site energy storage in the form of green hydrogen. HDF Energy is also developing extensive infrastructure for the mass production of carbon-free hydrogen.

Backed by a team of over 100 hydrogen experts boasting more than a decade of operational experience across the value chain, HDF Energy is currently developing a portfolio of projects valued at over €5 billion.

Headquartered in France, HDF Energy has regional offices in Latin America, the Caribbean, Asia, Africa, and Oceania with 30+ nationalities among its staff. Since 2021, the Group has been listed on the Euronext Paris stock market, member of the Euronext Tech Leaders segment.
More information, visit: www.hdf-energy.com

ABOUT PACIFIC TRADE INVEST

Pacific Trade Invest (PTI) Network is the Pacific region's lead trade and investment promotion agency, with offices in Australia, China, Europe, and New Zealand, and an office undertaking similar services in Japan.

As the trade and investment promotion network of the Pacific Islands Forum Secretariat (PIFS), PTI is tasked by Pacific Islands Forum Leaders to facilitate trade, investment and tourism deals between the economies of the Pacific Island Countries and Territories and the rest of the world.

PTI contributes to business growth in the Blue Pacific by facilitating commercial opportunities for export-ready and investment-ready businesses across the region. This is achieved through building business capacity, and connecting businesses with importers and investors in global markets.

PTI contributes to the PIF vision of "a region of peace, harmony, security, social inclusion, and prosperity, so that all Pacific people can lead free, healthy and productive lives." PTI's operating framework is also designed to align with and contribute to the United Nations SDG8 'decent work and economic growth'.

Our offices are funded through the support of our host Governments, the Government of Australia, the Government of New Zealand, and the Government of the People's Republic of China.

More information, visit: www.pacifictradeinvest.com

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Figure 1: Illustration of the Viti Levu Renewstable® power plant.

Figure 2: Overview of the process area of the Viti Levu Renewstable® Power Plant..

The Future Of Work: USP Event Marshals Support For More Women In Energy

Pacific Women In Power, World Bank

The University of the South Pacific (USP) hosted an event on 27 February in collaboration with the World Bank's Pacific Women in Power (PWIP) Program, Pacific Power Association (PPA) and Pacific Community (SPC) to boost female participation in Science, Technology, Engineering, Mathematics, and Physics (STEMP) fields, with a focus on the energy sector. The event was made possible by funding from Canada through the World Bank Energy Sector Management Assistance Program (ESMAP) that supports the Pacific Women in Power program.

The event, titled "The Future of Work: Women Can Lead the Pacific's Power Transition," brought together leaders and experts to discuss the transformative potential of gender diversity in the energy industry.

"Women and girls play a crucial role in shaping the future of the Pacific energy sector," Ms Helle Buchhave, the World Bank's Senior Social Inclusion Specialist and PWIP Task Team Leader said. "As the Pacific transitions towards renewable energy sources, women's perspectives, expertise, and leadership are essential. This event provided a unique opportunity to engage with energy industry experts, government representatives, donor partners, university students and their parents. Together, we explored how women can lead the way in the Pacific's sustainable energy transition."

Event Objectives and Vision

The primary aim of the event was to empower women in STEMP fields, particularly those linked to renewable energy and sustainability. USP Vice-Chancellor Professor Pal Ahluwalia emphasized, "This initiative is not just about gender equality; it's about tapping into the full potential of our talent pool to drive innovation and growth in the energy sector.

"We need to create a pipeline of skilled women in the energy sector who can drive change and bring fresh perspectives," said Professor Ahluwalia. "Our focus is not only on academic excellence but also on providing practical experience and mentorship opportunities."

Ms Bonnie Ann Sirois, the World Bank's Acting Country Manager, echoed this sentiment, highlighting the importance of interdisciplinary collaboration and the critical role women can play in the Pacific's energy transition. "Empowering women in these fields is essential for a sustainable future. The PWIP Program is committed to providing the necessary support and resources," she stated.

"Gender diversity is not just a moral imperative; it's an economic one. When we include women, we harness a broader range of skills and perspectives that can drive innovation and efficiency," added Ms Sirois.

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Fiji's Permanent Secretary of the Ministry for Women, Children and Social Protection, Ms Eseta Nadakuitavuki, said, "Women's full and equal participation in the energy sector, particularly in clean energy, is integral to environmental sustainability and economic development in our region."

She added, "An inclusive and expanded energy sector will also translate to greater economic empowerment by increasing women's access to paid employment and skills training in clean energy-related endeavours."

Strategic Framework and Initiatives

The PWIP Program's strategy was highlighted, which includes building evidence-driven business cases, engaging advocacy champions, and developing multi-year skill-building programs. These initiatives are designed to create a supportive environment for women pursuing careers in the energy sector. By fostering an inclusive culture, the program aims to break down barriers and open new opportunities for women.

Economic and Social Impact

Addressing the broader impact of gender equality, the event highlighted findings that suggest equal participation of women in the energy sector could significantly boost economic growth. "Studies indicate that gender parity in the workforce could raise GDP by up to 22% per capita in Pacific countries," noted Ms Sirois. This underscores the economic imperative of supporting women in STEMP fields.

Panel Discussions and Insights

A key component of the event was a panel discussion featuring prominent women leaders from the Pacific energy sector and other experts. They shared their personal experiences and professional insights, providing a powerful narrative on the benefits of diversity and inclusion. "Our stories illustrate that when women lead, we bring unique perspectives and solutions that can drive the sector forward," said one of the panellists.

Call to Action for Energy Experts

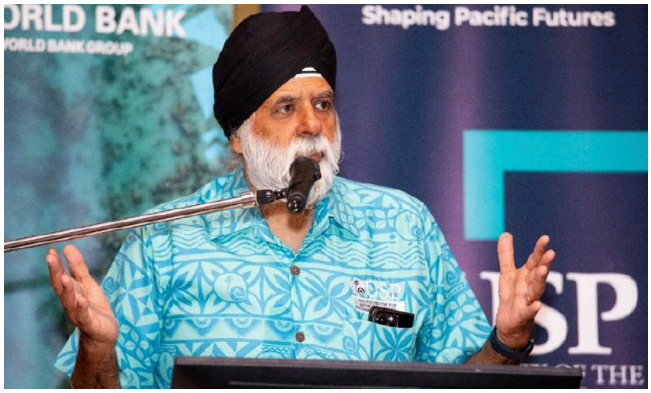
Booth Displays: Fiji-based businesses and development partners featured interactive displays showcasing innovations in renewable energy. The seminar concluded with a strong call to action for energy experts to mentor and support young women entering the field. By promoting equal opportunities and fostering an inclusive environment, the sector can harness the full potential of its workforce. "It is essential that we, as energy professionals, take an active role in guiding the next generation. Equal opportunities for all will be the cornerstone of our industry's future success," urged Sirois.

Highlights:

The Future of Work:
Participants heard from experts on topics such as clean energy technologies, policy frameworks, and career pathways.

Networking Opportunities:
Participants connected with like-minded individuals and built valuable professional relationships.

Featured Speakers:



"To our students: Choose wisely, study passionately, and remember that your education is not just about diplomas and degrees—it's about impact. And to our women leaders and aspiring leaders: Persist, break barriers, and light the way. Together, we shape a future where energy is sustainable, equitable, and powered by your unwavering resolve."

Professor Pal Ahluwalia, Vice Chancellor, University of the South Pacific

"The Pacific, vulnerable to the impacts of climate change, must adapt swiftly, and at the heart of this transformation are not only the men and boys aspiring to or already working in the energy sector, but also the women and girls who have an important role to play."

Ms Bonnie Ann Sirois, Acting Country Manager, World Bank

"Education is an essential means of empowering women with the knowledge, skills and self confidence to participate in the development process. Sustainable development is only possible when women and men enjoy equal opportunities to reach their potential. There is a need to ensure that the pool of qualified female STEMP graduates is available, and that they are interested in working in the energy sector."

Ms Eseta Nadakuitavuki, Permanent Secretary, Fiji Minister for Women, Children and Social Protection

"Under the PWIP Program, we have found that the average share of female employees in 14 surveyed power utilities in the Pacific stands at 18 percent. Women remain underrepresented across all utilities, except among administrative staff, where they reach an even 50 percent and just 5.5 percent of technical staff in STEMP fields are female."

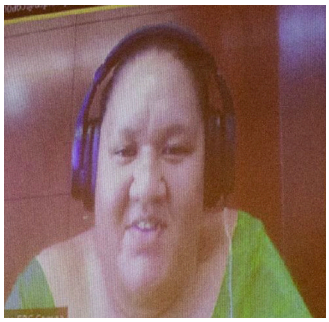
Ms Helle Buchhave, Senior Social Inclusion Specialist and Global Gender Lead, World Bank

"Thanks to initiatives such as the Pacific Women in Power Program and it's collaboration with key energy stakeholders, we hope to see an increase in women in STEMP fields at tertiary level, and hopefully that starts today with the students in this room."

Mr Gordon Chang, Executive Director, Pacific Power Association (PPA)

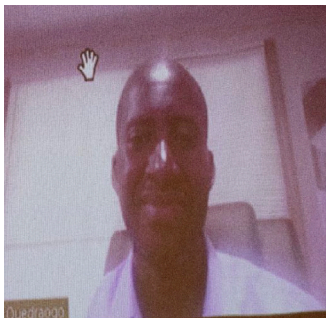
Panellists:

Caption: Online - Ms Sarafina Lesa, Samoa EPC Graduate Engineer and Mr Alain Ouedraogo, Senior Energy Specialist, World Bank; (l-r) Mr Hasmukh Patel, CEO, Energy Fiji Limited (EFL), Ms Helle Buchhave, Senior Social Inclusion Specialist and Global Gender Lead, World Bank, Ms Melelupe Vaka'uta, Current Engineering Student at USP and member of the Women's Engineering Association, Ms Teiiti Nia, Chief Engineer, Cook Islands energy utility, Te Aponga Uira (TAU), Dr Ravita Prasad, Assistant Professor, Fiji National University, and Ms Inka Schomer, Senior Gender and Social Inclusion Consultant, World Bank.



"I chose to be an engineer as I've always been fascinated by the potential for innovation in this field. I believe that energy is at the core of addressing some of our world's most pressing challenges, from climate change to sustainable development, and my job allows me to be a part of the solution."

Ms Sarafina Lesa, Samoa EPC Graduate Engineer



"The next 10 years, we are going to see a significant increase in renewable energy across the Pacific, which means there will be more jobs in this sector. This is based on Pacific Government's ambitious commitments to replace diesel-based energy with renewables. We will need people with engineering skills, as well as those with economics and finance, and specialist lawyers, and teachers."

Mr Alain Ouedraogo, Senior Energy Specialist, World Bank

"At EFL we are an equal opportunity employer, and I feel that the game starts at university. I think it's important that universities market to attract women into fields of engineering and energy. It is an old idea that women cannot get into engineering. This is not true. Twenty years ago we recruited our first graduate female engineer at EFL, Naomi, and she is here today, and will soon become one of the members of my senior executive team."

Mr Hasmukh Patel, CEO, Energy Fiji Limited (EFL)

"The prospect is ongoing learning is important to me in this field, and the hands-on experience I will get. I look forward to finding a good mentor, and hopefully another woman, as we don't have many. My dream is for my daughter, when she grows up, and other young female engineers, that they are not limited by their gender."

Ms Melelupe Vaka'uta, Current Engineering Student at USP and member of the Women's Engineering Association

"What inspired me to take this path was my passion for data analysis - I was fascinated with what stories data can tell. I was really interested in the engineering pathway, made my interest known to management and was given the opportunity to be in a technical role, and loved on-the-job training and opportunities. Six years on and I'm Chief Engineer. Electricity is my magic!"

Ms Teiiti Nia, Chief Engineer, Cook Islands energy utility, Te Aponga Uira (TAU)

"I teach physics and renewable energy at FNU, and my message to parents, or if you have sisters or wives who are passionate about energy and engineering, let them pursue their passion, and they will succeed. There are expectations that women are the nurturers at home first, but what I see in my classroom is that we have a number of girls and working or single mothers who can succeed."

Dr Ravita Prasad, Assistant Professor, Fiji National University

"We are really seeing more women coming into this renewable energy space, globally. For example, in Sub-Saharan Africa, 30 percent of renewable energy companies there that are publicly listed are headed by women. Compare this to the G20, across all sectors, women leading publicly listed companies is only about 3.5 percent. We also acknowledge that we need more men to advocate for more women in energy – the power brokers – to be a part of that conversation."

Ms Inka Schomer, Senior Gender and Social Inclusion Consultant, World Bank.

Tradebooths

NiuPower

Together We Can

NiuPower is an independent power producer headquartered in Papua New Guinea.

We mobilise capital to deliver, operate and maintain energy generation or storage technologies as hybrid solutions or as part of a grid or microgrid. We adopt a practical, flexible and modularised approach to meeting the specific needs of a customer.

One of our core capabilities is the ability to partner with Government at all levels, indigenous owners of land and State-Owned Enterprises to deliver business outcomes.

NiuPower currently owns a 60MW gas fired power station near Port Moresby operated by its O&M and OEM partner, Wartsila.

Given there is gas in excess of our requirements, we are seeking to set up domestic and regional markets for LNG throughout our neighbours in Micronesia, Polynesia and Melanesia.

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Over-The-Air Updates Bring New Features To Compact Construction Equipment

Dr. Maren Wernicke, Over-the-air updates bring new features to compact construction equipment
Motorvenfabrik Hatz GmbH & Co. KG

We know and appreciate over-the-air updates (OTA updates) from our smartphone, smart TV or even our car. Hatz Digital Solutions also enables the provision of additional functions or individual extensions for compact equipment via the IoT module.

Software always offers room for new functions, digital infrastructure and downstream services enable continuous optimization. The call to update our smart devices is something we are familiar with in everyday (office) life.

Since digitalization has found its way into the construction and agricultural industries, there is also the option of expanding or optimizing software functions in these sectors. However, in contrast to our always-connected office infrastructure, these machines are usually in use in inaccessible locations. What is needed here are over-the-air updates (OTA updates), i.e. software updates via the mobile network.

Convenience as with large machines also for compact equipment

Many large machine manufacturers already offer this option - but usually only for large machines or their top models with corresponding telematics solutions. With our Hatz Performance Tracking in combination with the Hatz IoT module, we now enable this update convenience for very small machines as well.

This saves the machine operator enormous effort, especially when it comes to updates that he might be legally obligated to make, for example relating to occupational safety. Performance Tracking users benefit from the fact that we at Hatz are responsible for the relevant updates. As a machine operator, you can sit back and rest assured that all machines are in the safest state of the art.

In addition, personnel and economic resources are sensibly conserved. Instead of service staff having to travel to the most remote job sites and locations, the update can be conveniently installed from the office computer at the touch of a button. Of course, this also has environmental benefits if the service personnel does not have to travel these distances.

Optimization made easy

Another major advantage is that we can perform software maintenance over the air. If, contrary to expectations, a complication should arise, we can conveniently intervene via the cellular connection. The machine operator is spared a costly and time-consuming visit to the workshop.

Transparency is also of the utmost importance to us. We provide our customers with comprehensive information about every update via our DSM (Digital Solutions Manager) management portal. There, they can also see exactly what the update contains and what benefits it brings. This way, our machine operators can always be sure that their machines, which they have equipped with Hatz Digital Solutions, are performing at their best.

20MW Of Capacity Added To The Grid

Guam Power Authority

As Part of Plans to Alleviate Load Shedding Throughout the Summer

The Yigo Combustion Turbine (CT) has returned to service providing 16 megawatts (MW) of capacity to the Island Wide Power System (IWPS). The Yigo CT was out of service due to significant damage from Typhoon Mawar almost a year ago. Additional work on the unit will continue over the next two months to bring its total capacity to 20MW.

The Talofofo Diesel Unit 2 also returned to service providing 4MW of capacity to the IWPS after not being available for several months. The return of these units totaling 20MW of capacity is a significant step in GPA's plan to mitigate load shedding.

"Despite facing setbacks from natural disasters and other delays, GPA's operations teams have effectively managed to minimize disruptions the past few months to our customers in the face of a generation capacity shortfall. We remain committed to maintaining operational efficiency and enhancing our power capacity as we work towards the commissioning of the Ukudu Power Plant on September 15, 2025," stated General Manager John M. Benavente, P.E.

The restoration of the Yigo CT is part of GPA's comprehensive strategy to address the island's energy capacity shortfall. By bringing the turbine back to the grid, it substantially helps meet the growing energy demands of Guam's residents and businesses and alleviates load shedding, particularly as we approach the warmer months of the year.

Plans to bring the Tenjo and Manengon Diesels back to service are on track. Teams are conducting significant repairs and rehabilitation of the units and anticipate an additional 12MW can be brought into the IWPS sometime in May. Additionally, the 20MW temporary power contract with Aggreko is progressing on time. GPA and Aggreko are working collaboratively and expeditiously to get the units online by July. GPA continues to work on a multipronged approach to resolve its power system shortfall, increase generation capacity and mitigate load shedding.

"We understand the importance of a stable and reliable power supply for residents and businesses, especially as we head into the summer season," added Jennifer Sablan, P.E., Assistant General Manager of Operations. "Though we are not out of the woods yet, we thank our customers for assisting in monitoring their peak usage between 5-11 pm and ask for your continued support to beat the peak," Sablan added.

GPA thanks the community for their patience and understanding during the restoration process.

Infrastructure On Track For Ukudu Power Plant Commissioning By September 15, 2025

Guam Power Authority

As GPA continues its steady progress in support of the Ukudu Power Plant, expected to be commissioned by September 15, 2025, work is underway for projects to support the new plant.

Specifically, the supporting transmission lines and pipeline projects will serve as vital arteries in the island's power distribution network, facilitating the seamless transfer of electrical power to and from the Harmon Substation to the Ukudu Plant. Simultaneously, the future pipeline will be dedicated to transporting essential fuel supplies, including Ultra Low Sulfur Diesel (ULSD) and potentially Liquid Natural Gas (LNG), along with a fiber network to support GPA's digital infrastructure for the smart grid.

Pipeline Construction Progress:

- Construction on Route 16 began on January 26, 2024, and is still underway.
- Excavation work has commenced along Route 34, laying the groundwork for the pipeline's route
- Excavation near the Barrigada Post Office began on February 12, 2024, extending the pipeline's reach into strategic areas.
- Collaborative efforts with the Department of Public Works (DPW) are ongoing to secure necessary permits for the remaining segments of Route 16.

Transmission Line Development Updates:

- Reviews of design and material specifications for transmission lines are currently in progress.
- Clearing of the designated area between Harmon Substation and the Ukudu Plant has been completed, setting the stage for transmission line installation.
- Pole foundation work within the Harmon Substation was completed.
- Installation work is ongoing to connect the transmission line between the Harmon Substation and the Ukudu Plant, ensuring seamless energy transmission.

The pipeline and transmission line projects are critical components in supporting the Ukudu Power Plant's operations and advancement of the Clean Energy Master Plan (CEMP). Simultaneously, GPA is actively pursuing amendments to the Energy Conversion Agreement (ECA) with Guam Ukudu Power, LLC (GUP).

These amendments are crucial for aligning project timelines with the Ukudu Power Plant's commissioning date. Although the amendments to the ECA were approved by the Consolidated Commission on Utilities, review and approval by the Public Utilities Commission (PUC) is pending.

For more information on the Clean Energy Master Plan and the status of the Ukudu Power Plant, visit www.guampowerauthority.com.

20MW Added to Capacity Reserves to Mitigate Load Shedding

Guam Power Authority

Although tangible progress in advancing plans to address the generation shortfall, GPA has announced the release of the May Potential Rotating Outage Schedule as a precautionary measure. It is GPA's intent to assist residents in preparing for outages in the event that energy demand exceeds capacity. While GPA recognizes the inconvenience these measures may cause, the schedules are intended to ensure the community is adequately informed and prepared. The May schedule is a carryover from April with no schedule changes.

Customers are urged to conserve energy, particularly during peak periods from 5 pm to 11 pm, to alleviate strain on the power grid. Simple measures such as raising air conditioning temperatures to 75 degrees or higher and turning off water heaters during peak hours can significantly contribute to stabilizing the power supply.

Beat the Energy Peak Between 5-11 pm

GPA continues to encourage customers to conserve energy during peak hours. Raising a/c temps to 75 degrees or higher and turning off water heaters between 5-11 pm are two simple steps residents can take that would contribute greatly to the overall stability of the power grid.

Energy Credits Conclude

GPA reminds customers that the third and final increment of the current Prugråman Ayuda Para I Taotao-ta Energy Credit was applied to all qualified GPA residential and commercial accounts. With no current extension of the credit program in place, customer can expect to see an impact on their bills. Bill 277-37(LS) which would extend the energy credit program and provide $300 in additional energy credits for active GPA account holders from April through June 2024 has been introduced by Senator Will Parkinson. The measure is pending action by the Guam Legislature.

Preparation for Summer Months

With the closure of the Homeowner Assistance Fund, customers are encouraged to prepare their homes to save energy during Guam's summer months. Income-eligible customers are also encouraged to contact the Guam Energy Office about the Weatherization Program.

GPA appreciates the continued cooperation and understanding of the community as we navigate these temporary challenges together. GPA remains committed to providing reliable and sustainable power to the residents and businesses of Guam.

Guam Energy Expo 2024

GPA teams joined forces and partnered with Guam Energy Office (GEO) to educate and engage attendees on energy efficiency and conservation at the recent Guam Energy Expo. From insightful discussions on power-saving techniques to live demonstrations of online tools like Energy Sense Online Rebates and My Energy Guam, patrons were equipped with information to take charge of their energy consumption..

MONTH	AVG. HRS./ FEEDER	DAYS OF OUTAGES
Sep 2023	5.7	20
Oct 2023	2.3	11
Nov 2023	4.8	9
Dec 2023	0.6	4
Jan 2024	0.9	4
Feb 2024	0.9	1
Mar 2024	0.5	1
Apr 2024	0.2	1

**Prior Avg. Hrs/Feeder data have been audited and updated as of Feb 2024.*

Scan the QR code and visitour social media pages to stay informed about rotating outages in your area.

Load Shedding Data as of April 29, 2024

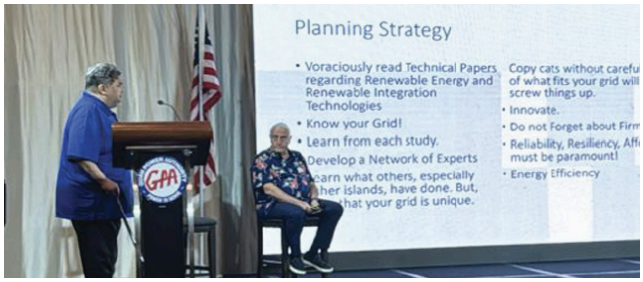
- Actual Outage Days in April: 1
- Actual Outage Days for 4/1 through 4/29: 1
- Actual Hrs/Feeders Lost in April (through 4/29): 0.21
- Avg. Hrs/Feeders Lost since September 1, 2023: 12.2

GPA's Guam Clean Energy Transition Symposium 2024

For the second consecutive year, GPA leaders have chosen the Guam Clean Energy Transition Symposium, held at the 15th University of Guam Conference on Island Sustainability, as the platform to report its renewable energy progress. This year's 2-day symposium took place on Monday & Tuesday, April 8 & 9, 2024, at the Hyatt Regency Guam.

GPA will achieve 50 percent renewable energy for the island by 2030. GPA General Manager John M. Benavente, P.E., is also optimistic about achieving this target even before that date.

GM Benavente, in his presentation on "The Journey to Affordable, Reliable, Resilient Energy on a Sustained Basis" at the symposium, also emphasized the importance of partnerships across different sectors to make this happen.

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LONGi Achieves New World Record For Silicon Solar Cell Efficiency, Introducing 2nd Generation Ultra-Efficient BC-Based Module

LONGi Solar Australia

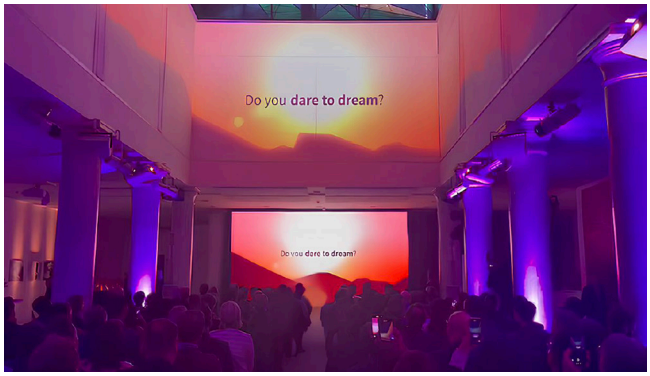
- Innovative solar panel manufacturer proudly announces a groundbreaking achievement: a new record in silicon heterojunction back-contact solar cell efficiency, reaching an impressive 27.30%. This milestone further solidifies its position as a leader in the global solar energy industry.

-Additionally, LONGi unveils its latest innovation, the Hi-MO 9 solar module. Boasting an industry-leading silicon solar module conversion efficiency of up to 24.43%, this new module sets a new standard for solar technology, promising exceptional performance and reliability.

Marid, Spain, May 7th, 2024— LONGi Green Energy Technology Co. proudly announces its latest milestone, breaking a new world record for silicon solar cell efficiency, further solidifying its position as a leader in the global solar energy industry. Certified by Germany's Institute for Solar Energy Research Hamelin (ISFH), LONGi's silicon heterojunction back-contact (HBC) solar cells have achieved an outstanding efficiency of 27.30% under laboratory conditions, marking the company's 17th world-record achievement in solar cell efficiency since April 2021.

27.3%, LONGi sets a new world record for silicon solar cell efficiency

This groundbreaking announcement was made during a celebratory event attended by LONGi's esteemed leadership, including founder and president Li Zhenguo, Vice President Dennis She, Chief Scientist Dr. Xu Xixiang, and esteemed client representatives from around the world.



The launch event of LONGi's new product
Xu Xixiang unveiling the new BC world record

LONGi's dedication to innovation and sustainability has positioned it as a frontrunner in crystalline silicon photovoltaics. Notably, LONGi now holds dual world records for both efficiency in crystalline silicon solar cells and efficiency in crystalline silicon-perovskite tandem solar cells. In November2023, LONGi set another world record in boasting an efficiency of 33.9% in crystalline silicon-perovskite tandem solar cells.

LONGi's founder and president, Li Zhenguo and Chief Scientist Dr. Xu Xixiang unveiling the new BC world record

Introducing the Hi-MO 9 Module

Highlighting its commitment to pushing the boundaries of solar technology, LONGi unveils its flagship Hi-MO 9 module at the special event in Madrid, Spain. The Hi-MO 9 module, featuring 2nd generation Hybrid Passivated Back Contact (HPBC) solar cell technology and the TaiRay wafer, promises exceptional performance with a maximum power output of 660W and an impressive conversion efficiency of up to 24.43%. Designed to thrive in diverse environments, including lakes, mountains, and deserts, the Hi-MO 9 module is poised to revolutionize solar energy generation worldwide.

Hi-MO 9 module

Dennis She, Vice President of LONGi Green Energy Technology Co., commented on the groundbreaking capabilities of the Hi-MO 9 module, stating, "Our new Hi-MO 9 module allows world-leading power generation and outmatches other technologies on the market in an equal land-use scenario. What's more, it retains this performance throughout its life, as the module is designed to the highest standards of reliability. Power plant owners can rest assured that a plant built from the Hi-MO 9 module will help them make the most efficient use of their land and get the most value out of sunlight."

The panels will be produced at the company's Jiaxing Production Base which has been recognized by the World Economic Forum as a Global Lighthouse Factory, a group of factories which have been judged to be accelerating the adoption of Fourth Industrial Revolution technologies in manufacturing.

Availability in Australia, NZ and Pacific Islands

The highly anticipated Hi-MO 9 module is scheduled to arrive on Australian shores by Q4 2024, thanks to LONGi's dedicated efforts to ensure a smooth and timely launch. New Zealand and Pacific Island customers can expect product around the same time.

For those curious to learn more about the product and eager for an exclusive sneak peek, interested parties are encouraged to reach out to their local LONGi representative or contact the company directly at au@longi.com. LONGi's team is ready to answer questions and share their excitement about the upcoming release.

About LONGi

Founded in 2000, LONGi is committed to being the world's leading solar technology company, focusing on customer-driven value creation for full scenario energy transformation. Under its mission of 'making the best of solar energy to build a green world', LONGi has dedicated itself to technology innovation and established five business sectors, covering mono silicon wafers cells and modules, commercial & industrial distributed solar solutions, green energy solutions and hydrogen equipment. The company has honed its capabilities to provide green energy and has more recently embraced green hydrogen products and solutions to support global zero carbon development.
www.longi.com/au

Contact:
LONGi Solar Australia Pty. Ltd.
Email: aumarketing@longi.com

Energy In Transition

Geogas

LPG is a versatile, portable, clean and efficient energy that is readily available throughout the South West Pacific, providing energy security through dedicated seaborn supply to all the island nations. On a world scale, more than 300 million tonnes are consumed annually on all six continents, and in addition to being used for cooking, it is an acceptable and affordable fuel for a wide number of applications in agriculture, industry, transportation and power generation.

According to the United Nations International Panel on Climate Change (IPCC), LPG is not a greenhouse gas, meaning it is assigned a global warming potential (GWP) factor of zero.

More than 70 countries covering over three-quarters of global emissions have set net zero targets aligned to the Paris accord, and at the same time thousands of cities, businesses financial institutions and educational bodies have independently pledged action to reduce carbon emissions. Thus the world is in a massive and urgent energy transition, and LPG is the ideal fuel for this transition because of its accessibility and cleanliness, used as either a primary source or in conjunction with renewables, especially for hot water and space cooling.

The Geogas Group has been bringing LPG to the S W Pacific for a period spanning six decades, and as recently as last year has increased its footprint in this region through the acquisition of Origin Energy's businesses in American Samoa, Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands and Vanuatu. From our office in Sydney we operate a fleet of Small Gas Carriers that can enter all regional ports and anchorages, and with this regional base we are readily contactable in real time to offer reliable service and support.

We are backed by the Group's global seaborn system which delivers some 7 million tonnes annually employing 60 Gas Carriers ranging from 91'000 down to 4'000 cubic metre capacity. We have a small but energetic team focusing on the use of LPG in power generation, for off-grid micro power stations to reduce strain on power grids as well as larger-town based generators. LPG is often thought to be beyond consideration by those involved in electricity production, but with a base price linked to the rest of the barrel (including Diesel), a measurable improvement in emissions, lower maintenance costs and a cleaner working environment, the overall cost compared with more polluting fuel cannot be ignored.

Today, energy production based on LPG fuel has grown steadily in regions with little access to natural gas, and offers dual fuel solutions with biogas and cogeneration technologies to that can achieve excellent efficiency for utilities, industries, hospitals, distilleries, hotels and resorts to name but a few potential uses.

Hospital de la coneception Puerto Rico

Reliable and proven LPG power technologies are offered by a number of manufacturers: Solar Turbines, Jenbacher, Guascor Energy, Capstone Turbines, Wartsilä, and Siemens Energy amongst others.

Over 50 MW of LPG generated power has been installed in Puerto Rico for pharmaceutical industries, hospitals, and distilleries. Also 50 MW in St Thomas and 20 MW in St Croix for utilities in the US Virgin Islands (USVI), 30 MW in Honduras, 50 MW in Columbia, and more than 50 MW for two gold mines in Ghana.

Geogas is presently working on numerous opportunities in the Pacific region to provide LPG/biogas transition for private industries and utilities.

Margaritaville resort - USVI

We will introduce these solutions more in detail, together with number of references at the forthcoming Pacific Power Association's 31st Annual Conference hosted by Tonga Power and we look forward to seeing you in the Falemasiva Hall in Nuku'alofa from 30th September – 3rd October 2024. Please do get in touch beforehand by sending an email to Mr Chris Clark – CEO at chris.clark@geogaspacific.com. Also please visit our website – GeogasPacific.com

WELCOME!!

TO THE NEW ALLIED MEMBERS

Seven (7) new Companies has joined the PPA as Allied Members since our last PPA Magazine.

The new Allied Members are:

PALLADIUM INTERNATIONAL PTY LTD
Palladium International Pty is based in Brisbane, Australia. Their primary activity is project management.

STAR BRIGHT ENERGY (FIJI) PTE LTD
Star Bright Energy (Fiji) Pte Ltd is in Ba, Fiji. Their primary activity is retail, wholesale renewable energy systems. Their secondary activity is design, consult, mini grid systems including integration of multiple energy sources.

SYNTELL CO
Syntell Co is in Cape Town, South Africa. Their primary activities are information systems/software, metering and instrumentation and utility management.

ECOSUN INNOVATIONS
Ecosun Innovations is in Wettolsheim, France. Their primary activity is power generation. Their secondary activity is renewable energy systems.

ENERGY POOL DEVELOPMENT
Energy Pool Development is in France. Their primary activity is control and monitoring systems, renewable energy systems, and EMS. Their secondary activity is demand side management, SCADA, and power system studies.

TESLA INC.
Tesla Inc. is in Alaska, United States of America. Their primary activity is microgrid controls and industrial energy storage. Their secondary activity is electric vehicles, EV charging and residential energy storage.

EIGIGU PROCUREMENT
Eigigu Procurement is in Brisbane, Australia. Their primary activity is renewable energy projects (Waste-to-Energy). Their secondary activity is procurement and international logistics.

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