



3
Tech

Power • People



Total power solutions

3Tech Corporate Ltd. is a leading provider of “total power solutions”. That’s the design, supply, installation and maintenance of electrical generators and renewable power systems.

Since 1998, 3Tech has built a team of professional technicians and engineers to provide excellent service and quality products in the field of energy solutions. From headquarters in Hong Kong the company operates a global network of sales service centers with a strong presence in Africa.

The core business has been the supply of diesel generators and ancillary accessories, mainly to the telecommunications industry. Network management services is a growth area for 3Tech as successful turnkey solutions for power and communications equipment lead to telecom operators contracting out the maintenance of their networks.



Renewable energy

3Tech designs and builds solar power systems and installs wind turbines. In Hong Kong we have served as contractor to the government, power companies and other institutions on many renewable power projects. Renewable energy can be the most practical and affordable power solution in remote locations and less developed countries.



Electrical and Mechanical (E&M) Services

The professional staff at 3Tech includes Chartered Engineers and qualified service providers for energy and carbon audits. The company is a registered electrical contractor to the HK Government (EMSD). Our Electrical and Mechanical (E&M) services team provides a complete E&M solution from design and installation to maintenance services. 3Tech provides a full range of building services installations such as electrical, HVAC, structure cabling and ELV systems for new or A&A projects.

Experience and expertise

Clients include government departments, utility companies, schools and commercial organizations. Examples are the electrical installation for Lingnan University, Term Contract for the Hospital Authority and China Light & Power's AMR projects. The E&M team also manages renewable energy projects, both on-grid and off-grid. Well known examples are the off-grid solar project on Tung Ping Chau for LCSD and the hybrid wind turbine and solar project on Town Island for CLP.



Solar

3Tech is experienced in grid connection procedures and familiar with power company requirements. Designing a solar power system that is efficient, optimized and user-friendly requires expertise. 3Tech has qualified staff with the practical experience to provide professional design, installation and monitoring services.



Solar PV panels

When the Architectural Services Department of the Hong Kong Government decided to put the roof of their APB Centre in Hung Hom to productive use, they turned to 3Tech to design, supply and install this impressive array of solar PV panels.

This CLP grid-connected system uses 104 monocrystalline panels by Suntech to cover an area of 153m². Each panel is rated at 175Wp (under standard test conditions) and the system generates on average about 72kWh of electricity per day. That is a saving of around 15 tonnes of CO₂ annually or 375 tonnes over the system's expected 25 year lifetime. Typically, solar PV panels will repay the carbon emissions from their manufacture in 1 to 2 years.

Professional design

Connecting to the grid requires sophisticated inverters, protected devices and meters to monitor power quality. To maximize the solar energy output, the panel frames face south and are angled up at 22 degrees to face the sun. All panel frames are hot-dip galvanized steel to survive the hot and humid weather in Hong Kong. The system employs three inverters by SMA to convert the direct current produced by the PV panels to three-phase alternating current matching the mains electricity supply. 3Tech also installed a monitoring system to show the real-time irradiance level and power output.





BIPV

Building integrated PV (BIPV) is ideal for canopies and skylights. Solar PV cells are laminated between two sheets of glass and used in place of conventional panes of glass. This BIPV installation is found at the library of St. Paul's Co-Ed College Primary School and is rated at 8kWp.

This attractive skylight not only generates power but also provides shade resulting in lower costs for air-conditioning. It demonstrates to parents and students that the school cares about energy efficiency.

Competing Technologies

The two leading solar PV technologies are both silicon based: crystalline and amorphous thin film. Each has its own characteristics.





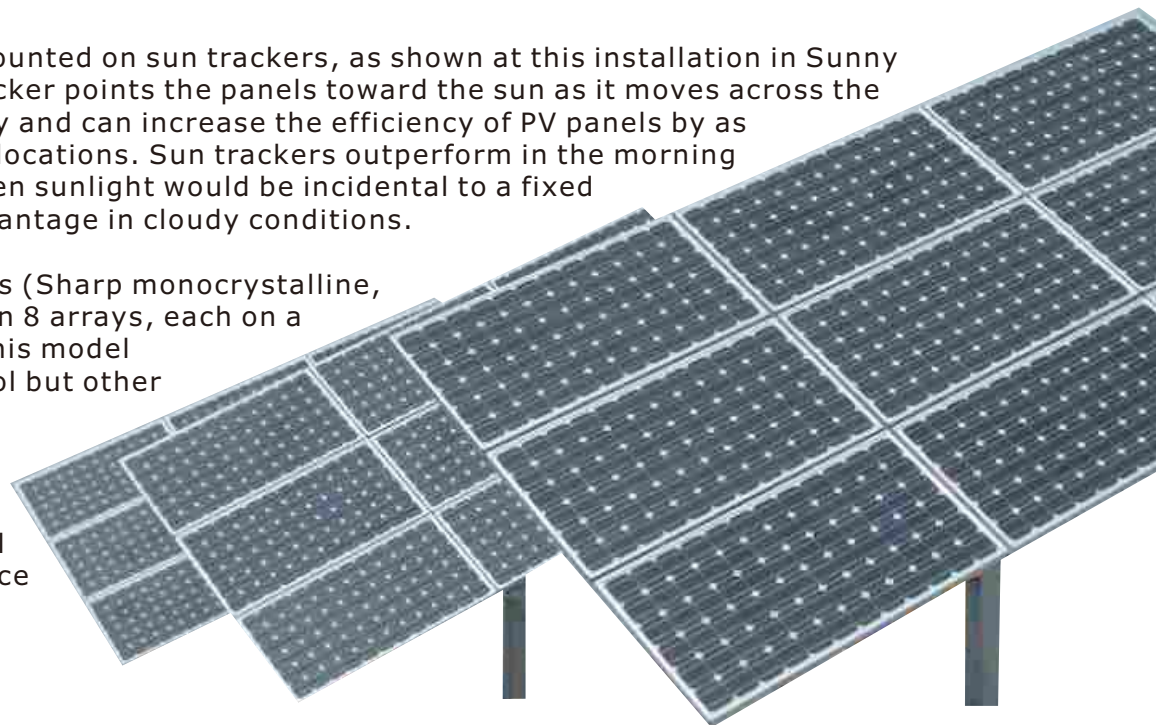
Solar Hot Water Panels

3Tech installed solar hot water panels on the roof of the Electrical and Mechanical Services Department of the HK Government. These are evacuated tube solar collectors covering an area of 56m² and providing a daily average of about 2,000L of hot water at 60°C. Solar hot water panels use the sun's energy more efficiently than PV panels and this installation saves about 40,000kWh a year. That's an annual saving of 20 tonnes of CO₂.

Sun Trackers

Solar panels can be mounted on sun trackers, as shown at this installation in Sunny Bay, Lantau. A sun tracker points the panels toward the sun as it moves across the sky throughout the day and can increase the efficiency of PV panels by as much as 40% in some locations. Sun trackers outperform in the morning and late afternoon when sunlight would be incidental to a fixed array, but offer no advantage in cloudy conditions.

At Sunny Bay 72 panels (Sharp monocrystalline, 170Wp) are mounted in 8 arrays, each on a Lorentz sun tracker. This model employs a timer control but other types use light or heat sensitivity to track the sun and can move on either a single or double axis. Additional capital and maintenance costs must be weighed against the potential increase in efficiency.



The background of the slide features a silhouette of a wind turbine on the left side. In the center, a person is shown holding an umbrella, standing on a grassy hill. The scene is set against a blue sky with falling leaves or petals on the right side. The overall aesthetic is clean and modern, emphasizing nature and renewable energy.

Wind Turbine

3Tech supplies a range of small upwind and downwind type wind turbines rated from 300W to 20KW. We also supply turbines from selected manufacturers like Proven of the UK. 3Tech has the knowledge and experience to advise on model and site selection with particular attention to safety.

The environmental benefits of wind energy are clear. A wind turbine will repay the carbon emissions from its manufacture, transportation and installation in less than a year. The lifetime of a wind turbine is typically 15 years.



6kW turbines

The street lights at Po Kong Village recreation ground in Hong Kong are powered by two small wind turbines. These 6kW turbines by Proven of the UK stand on 9m towers and have 5.5m diameter blades turning brushless, direct drive, permanent magnet generators. In high winds the blades of these downwind turbines will turn and flex away from the wind. With a survival wind speed of 70m/s (245km/h) this installation is safe even in the typhoon season.

The turbines begin to generate electricity at wind speeds above 3m/s. Because wind is an unpredictable and variable resource, the turbines may not produce power when it is needed. Therefore they are used to recharge a bank of valve-regulated lead-acid (VRLA gel type) batteries which power the load. With an inverter, the turbines could be connected to the electricity grid.



YMCA



Sunny Bay



Po Kong Village



Diesel

3Tech and FG Wilson

3Tech supplies diesel generators manufactured in the United Kingdom by FG Wilson. Powered by Perkins engines and Leroy Somer alternators, FG Wilson generators are market leaders. They are compliant with European Union Stage II emission legislation and are certified worldwide.

Quality is value

3Tech often provides off-grid solutions where the generator must run continuously for long periods. That's why the very high quality engineering of FG Wilson is so important. Efficient fuel consumption and low maintenance means long term value for our customers.

Professional service

3Tech has thousands of generators in stock at our warehouses, ready to deliver anywhere in the world. With our knowledge, experience and extensive service network, our dedicated engineers and technicians always deliver reliability, value and professional customer service.



Customized solutions

3Tech supplies customized diesel generators to telecom operators, especially in Africa where we work closely with the large Chinese telecom equipment suppliers, Huawei and ZTE. The generators are mostly used to power the base transceiver stations (BTS) that make up mobile telephone networks. These BTS must operate 24 hours a day but are often located in places with intermittent or non-existent electricity grid supply making a reliable, independent power supply essential.



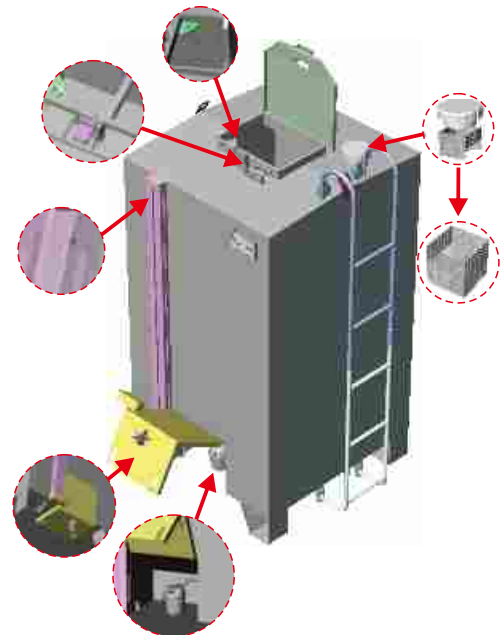
Automatic Transfer Switches (ATS)

3Tech designs and manufactures automatic transfer switches (ATS) for both indoor and outdoor use. These ATS are employed in some power systems to switch from a primary power source to a secondary source. For example, an ATS will detect a failure in the mains supply and start up a standby generator until the mains supply is restored.



High security and bulk fuel tanks

At telecom cell sites, especially in remote locations, the theft of diesel fuel is a problem for the operators and service providers. It causes not only a direct economic loss to the operators, but also adds to the responsibility of the site services provider and results in false complaints of high fuel consumption to the diesel generator set manufacturers. 3Tech manufactures high security fuel tanks with a simplified fuel pipe and connector design that is locked and protected. Bulk fuel tanks save on operating costs by reducing the frequency of refueling.





Hybrid Power System

Hybrid power systems

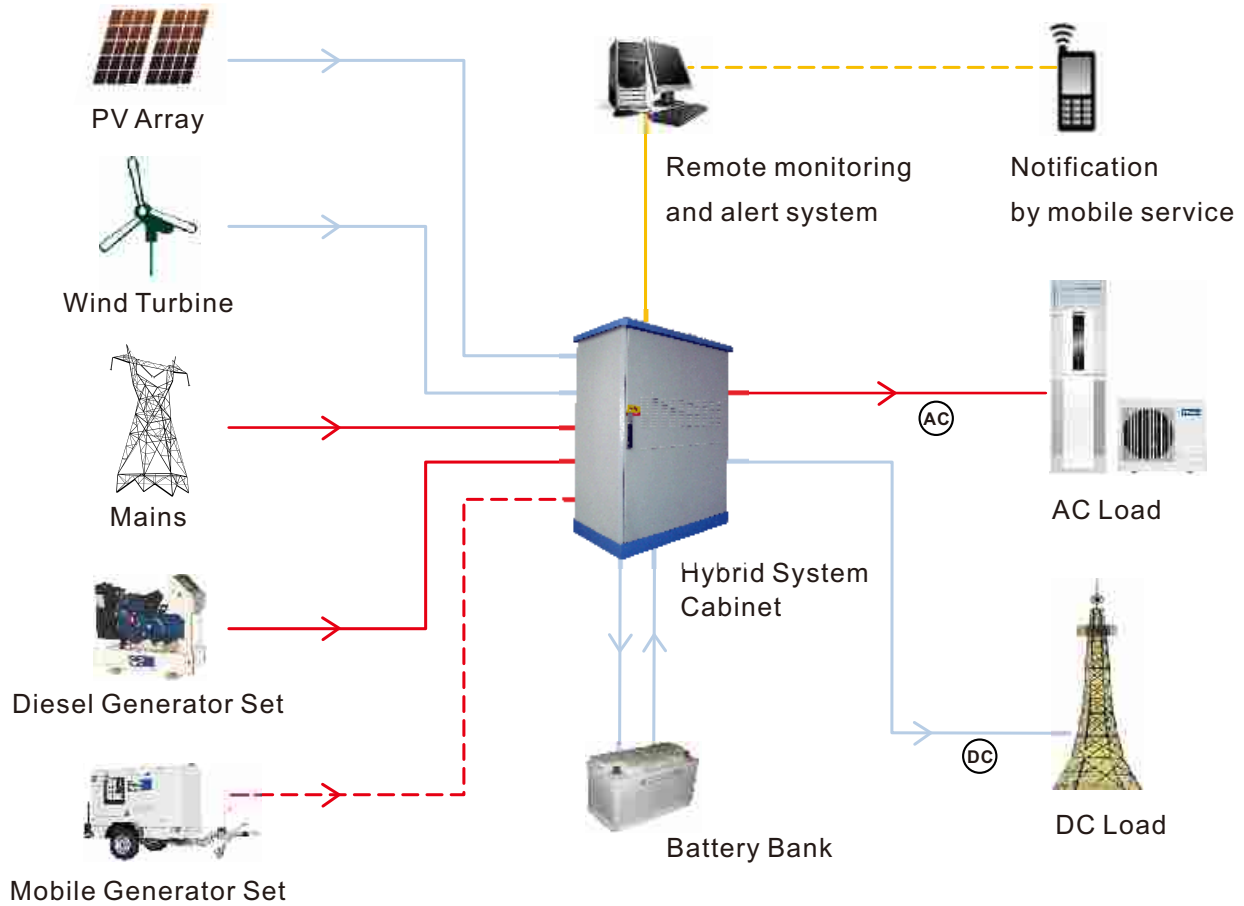
Solar PV panels, wind turbines, diesel generators and batteries can be most effective when they work together in a hybrid power system. Renewable sources are cost-effective and environmentally friendly while a diesel generator is a reliable back-up power source.

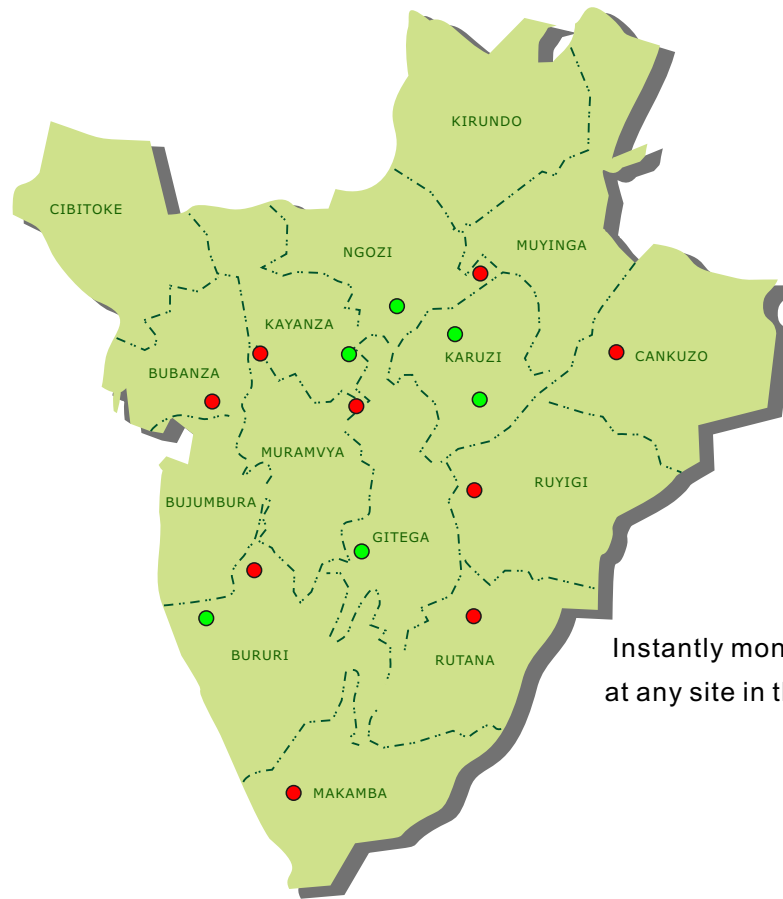
Solar/diesel/batteries

At Tong Ping Chau, a protected island in Hong Kong waters, 3Tech installed a hybrid solar/diesel power system to supply electricity to the public washrooms. 48 solar PV panels (each 175Wp, for a total of 8.4kWp) charge a 48V, 2,000Ah battery bank. If the batteries discharge over several consecutive cloudy days, a 15kVA diesel genset is standing by.

Reduced pollution

This hybrid system is the first of its kind to be installed in Hong Kong and is being closely monitored by 3Tech. The system guarantees a reliable power supply in a remote location while greatly reducing the consumption of diesel fuel and the resulting emissions and noise.





Instantly monitor system performance at any site in the national network.

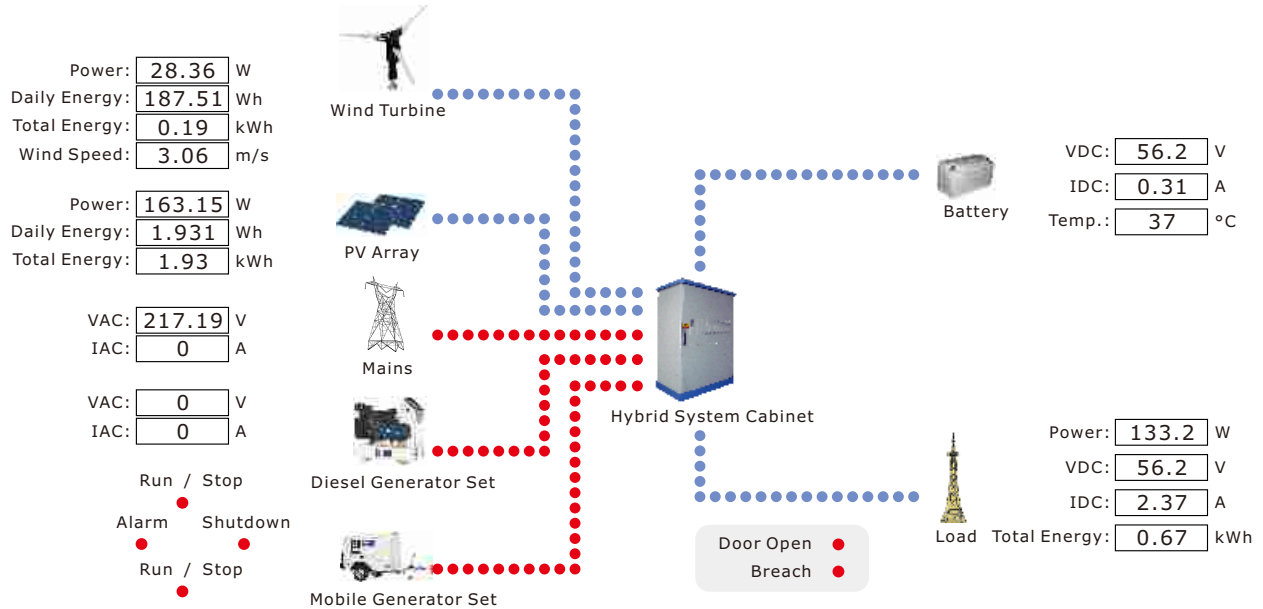
Substantial savings

3Tech is promoting the use of hybrid power systems to telecom operators, combining efficient renewable energy sources with reliable diesel generators. By reducing the consumption of diesel fuel and the costs of generator maintenance, the increased capital cost of solar panels and batteries is quickly repaid by the substantial savings in operating costs. That not only lowers phone bills and improves the competitive position of the operator, it also protects the environment and reduces carbon emissions.

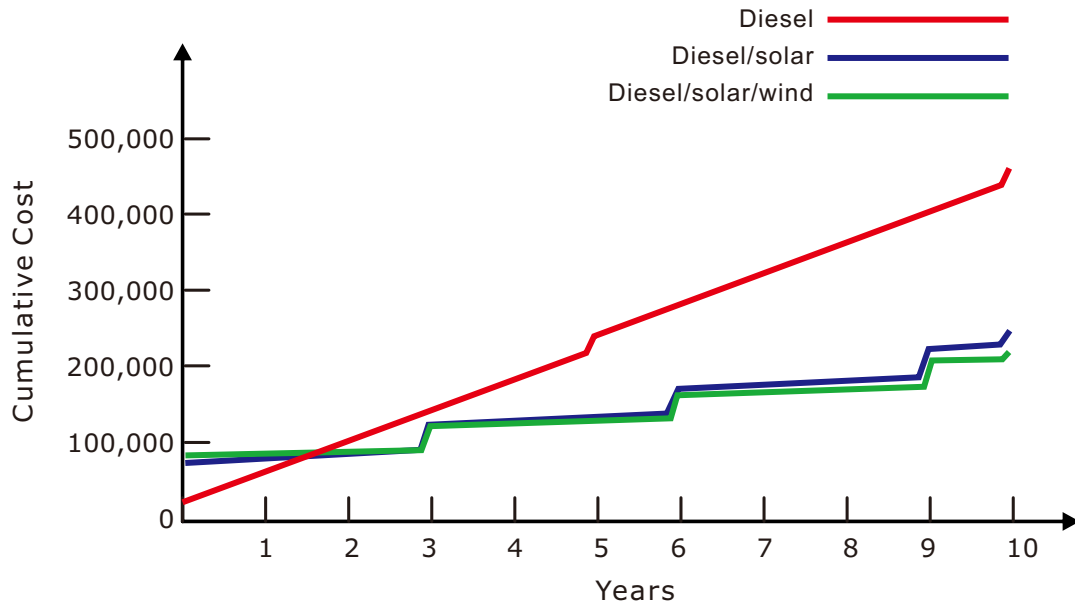
Remote monitoring

3Tech has developed a sophisticated remote monitoring system that allows the operator to view real-time data from cell sites across the entire national network. Data can be transmitted by GPRS or Wi-Fi and the operator is alerted to faults and low fuel level through the internet or by SMS. This ensures a prompt response to any problem and allows for the optimization of maintenance schedules. Comprehensive data is presented in a customized reporting format for performance analysis.

Comprehensive data is presented in a user-friendly interface.



Increased capital costs are quickly repaid by reduced operating costs.



Diesel/Hybrid Cost Comparison (48VDC, 2,000W, 2 day back-up)

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