

From Fuel Cells to Renewable Energy

FROM FUEL CELLS TO SOLAR-POWERED ENERGY SOLUTIONS



25 years ago, attitudes concerning renewable energy started to change as environmental concerns became more apparent. Coupled with the scarcity of natural resources; technological advancements made a large push to create new and more convenient ways of obtaining renewable energy like wind power, hydroelectric power, or even solar power in homes and businesses. The long-time use of the combustion engine was in need of an upgrade and in the 1990s; the world was introduced to the first-ever fuel cell electric engine for commercial automobiles. Demonstrated by the U.S. Department of Energy and Arthur D. Little management consulting firm in conjunction with Plug Power and the Energy Department's Los Alamos National Laboratory in 1997, the fuel cell managed to generate electricity using oxygen from the air and compressed hydrogen.



Since its first commercial use more than 20 years ago, the fuel cell has managed to spread into public and corporate usage for large scale operations. A new "tri-generation" fuel cell and hydrogen energy station in California can not only produce transportation fuel for dozens of electric cars each day, but also electrical power for a nearby industrial facility. The fuel cell has been an important step for alternative and renewable energy since it has helped bring more mainstream attention to "green" technologies that can affect larger populations and facilities.

Companies are now constantly looking for new ways to utilize other forms of alternative energy, like solar power- which is being used by homes and businesses to power various appliances. Solar panels, which are made up of a series of small semiconductors, can convert direct sunlight particles into electrons and can then be converted into electricity. This electricity can then be sent directly into fuse boxes to power applications such as HVAC, lighting fixtures, charging stations for electric vehicles and more. Over the years, solar cells have been made with different material including different types of silicon, which has led to improved efficiency in capturing and converting sunlight. Early silicon solar cells had 6 percent efficiency

in the 1950's but now reach more than 44 percent in recent years- meaning higher sunlight absorption and increased electricity wattage. Furthermore, the creation of the energy storage battery means gives homes and businesses the ability to use solar energy to power their facilities at any time of the day, not just when the sun is shining.

Utilizing solar power as an alternative energy source is not only helping reduction in global greenhouse effects, but also saves money on energy bills and decreases electric utility usage. Storing solar energy can now be achieved with energy storage batteries, which can be used to absorb energy at various times during the day and provide electricity for home or large facilities' energy consumption. Axiomtek's embedded controllers, like the [ICO](#) or [rBOX DIN-rail](#) series, can be programmed to prevent overcharging, monitor operational functions, communicate key data and status and optimize energy use based on usage patterns and setting preferences.

Axiomtek's [DIN-rail embedded controllers](#), [the rBOX product series](#); [heavy-duty fanless touch panel PCs](#), [the GOT product series](#); and [embedded systems](#), the [ICO](#) and [IPC](#) product series are suited to perfectly work in the renewable energy and power utility industries. These products have useful features including rugged designs for use in harsh environments, wide operating temperature ranges, wireless connectivity for communications, wide voltage ranges, high graphics performance, and Power over Ethernet capabilities. Axiomtek provides product solutions to help support the "green" energy movement. Contact us at solutions@aximtek.com or visit our website us.aximtek.com for more information.



The ICO300