

Fuel Cell Generated Power

Technology

Fuel cells are a possible source of power for the future that is clean and safe for the environment. How does a fuel cell work? The workings of a fuel cell are relatively simple, however until recently the materials needed to create an efficient and realistic fuel cell were not available. A fuel cell utilizes hydrogen and oxygen gas to create an electric current. Hydrogen can be extracted from natural gas, methanol or petroleum and oxygen is obtained from outside air. These two gasses are passed through separate channels separated by a platinum membrane that has an anode and a cathode on either side. The platinum acts as a catalyst in which hydrogen proton travels through the membrane to the oxygen as the electron travels around the circuit to create an electric current. The hydrogen and oxygen combine to create water that is the only byproduct of the reaction. A single fuel cell only creates a small voltage, therefore several cells are combined to create a working fuel cell that will create the needed voltage to run a piece of machinery. Fuel cells are able to run anything electric and they are currently being developed to run electric cars.

Ethical Template

Social Impact

There main with fuel cells is the cost of incorporating them into society. The same issues will always exist when it comes to alternative forms of energy. Petroleum generated electricity and petroleum based fuel will have a strong hold on the market as long as the oil companies have a large influence on government, electricity and fuel prices are relatively cheap and the negative effects on the environment are still widely accepted. Also, electric driven cars have lower performance than gasoline powered automobiles. It is very hard to get society to change to something less for the long term good. A complete social change to fuel cells will not happen, however a slow change in the focus on petroleum based electricity and fuel can happen over time. I don't see a realistic change to fuel cells unless the above criteria changes.

Ethical Questions

Fuel cells would create a change in the energy industry that would cause financial problems and workforce layoffs in the short term. Fuel cell companies will create jobs, however the people in the petroleum industries would not have transferable skills to change to the fuel cell industries. In the long term the industries and workforce will balance, however will the short term change be fair to the people who will see higher costs and the people who will lose their jobs. I don't see the short term being accepted unless the above criteria change.

Legal Implications

Any legal impacts will be between the existing oil companies and the new fuel cell companies. Oil companies see any alternative forms of fuel as a threat to their core business and will try to protect it using the law and the court system. Fuel cells does not violate anyone's rights however it will create maximum good for the people and a common good for the environment.

Economics

Fuel cells do not create cheaper electricity and machines that incorporate fuel cells are also not cheaper. However, technology and the increasing utilization of fuel cells will make fuel cells more competitive. Oil will have a stronghold on the world's energy because of the many countries that solely rely on oil for income. A complete change to fuel cells would cause havoc on the world's economy, however the slow acceptance of fuel cells as an alternative form of generating power will be beneficial.

Environmental Issues

Fuel cells can have a huge positive affect on the environment because it's only byproduct is water. Petroleum products create many hazardous byproducts that are destroying the environment. However, the water vapor created by the fuel cell is emitted into the air. The environmental issues related to a large

amount of fuel cells emitting water vapor into the air is not known. It may cause a large jump in humidity or buildings in densely populated places may stay damp.

Unanticipated Consequences

The effects of mass production of hydrogen are not known. Also, hydrogen is an explosive gas and may cause a large disaster if there is an accident with a large amount of hydrogen.