

# Introduction to Alternative Energy

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We now stand at an important historical crossroads in terms of the structure of both American and global society. The focal point of our changing world is our growing dependence upon foreign oil and our rapidly diminishing traditional sources of energy such as oil, natural gas, coal and nuclear power. Americans are addicted to oil and other forms of energy and our need for energy grows exponentially as American industry grows. There is especially a depletion of usable light sweet crude oil. The simple fact, which every authority agrees upon, is that our need for energy is soon going to outpace our ability to draw energy from traditional resources. The global supply of coal, natural gas, and most importantly oil are becoming depleted, nuclear power is too dangerous, and without alternative energy sources we will experience a severe lack of energy in the future. Therefore it is necessary for us to discover alternative energy sources in order for our industrial and commercial future in the twenty-first century to be secure.

Another reason for the need for alternative energy sources to be developed is the increasingly devastated state of our environment. The use of nuclear power, oil, gas and coal all produce a great deal of waste product which pollutes the environment. Oil, natural gas and coal produce toxic smoke which pollutes the air and affects global warming, while nuclear produces radioactive waste and can give rise to environmental disasters such as the Chernobyl and Three Mile Island accidents. For these reasons it is going to be necessary to shift to alternative energy sources in the future in order to maintain a sustainable ecosystem.

Fortunately for us, new and environmentally friendly energy supplies are being developed. Alternative energy methods are technological advances similar to the development of candles or kerosene for older civilizations. These energy resources have gone largely untapped in the past, and they represent the future of global energy consumption. Most people do not know about these growing energy trends, but as we enter the new century these new alternative forms of energy are poised to become as popular as the more traditional forms of energy that they will replace.

The purpose of this website, Alternative Energy News Source ([www.Altnews.com](http://www.Altnews.com)), is to offer news, commentary and analysis relating to the alternative energy industry. We seek to offer investors and businessmen useful information on the various forms of alternative energy and where the industry is heading, and we also have the purpose of helping environmentalists learn new and better ways to help achieve a green, clean environment. We will present up-to-date news headlines about alternative energy information as the news becomes available. We have links to a variety of resources on the web, we have a page on each kind of alternative energy, and we offer features such as interviews with experts, research reports on alternative energy companies, a list of seminars and conferences, and a list of alternative energy stocks. We encourage you to

become a member of our website, in order to access our monthly downloadable printable magazine and our message board.

An overview of the various kinds of alternative energy follows. At the outset we must differentiate between alternative energy, and renewable energy. Alternative energy refers to any form of energy which is an alternative to the traditional fossil fuels of oil, natural gas and coal. Renewable energy are the forms of alternative energy that are renewed by the natural processes of the Earth, such as sunlight from the sun or wind from the air, and so are environmentally friendly. We cover all alternative energies, but we will begin the overview with the renewable energy sources.

Solar power arises from the light of the sun, which can be harnessed through the use of solar power cells, which are also called photovoltaic cells. Sunlight is easy to harness and free, but it can be difficult to harness solar power for large scale power plants. However, there are several solar power plant projects in existence. Solar power has a great deal of potential in the field of home electricity generation. Solar power is attractive because sunlight is free and the only cost involved is the cost of solar panels. Solar is also very environmentally friendly, as it produces no pollution or waste byproduct, and it is therefore essential for a greener future. Solar panels come in various sizes and can be used on a small scale by mounting solar panels on a house for home electricity production, or they can be used on a large scale for electricity production. Solar is most commonly used for on-site local electricity production, by adding solar panels to the roofs of homes or commercial buildings. It is often used by consumers who want to help the environment, and also plays a vital role in supplying power to buildings that cannot easily access power lines. The three common solar power technologies are silicon, thin-film, and solar thermal.

Wind power is also a very attractive field. Wind technology has grown in scope, and in various places wind is becoming a feasible source of energy. Wind has a lot of potential and investors should keep an eye on it. Wind is vulnerable to weather conditions, but in certain locations, mainly in coastal offshore areas and at high altitudes, there is a steady stream of wind. Wind power is harnessed through the use of wind turbines, which are turned by the wind to produce electricity. The technology is not unlike a more modern and sophisticated version of a windmill. Wind power can be used both for electricity production on a large scale with multiple turbines to form what is called a wind farm, or in other words a wind power plant, or, more infrequently, on a smaller scale for home electricity production. Wind power is the most persecuted of all forms of renewable energy, as there is a multi-national anti-wind lobby that accuses wind turbines of being ugly, noisy, interfering with radars and killing birds, all of which are completely unjustified claims.

Geothermal energy is also an exciting new area. Geothermal energy draws heat from the planet's core. Thermal power stations are set up which absorb energy from the planet. The heat from the planet boils a liquid which evaporates to turn turbines, producing the electricity. This technology is feasible because thermal heat is free and the only cost is the station. However, the locations where geothermal heat is easily available are limited

and change based on tectonic movement and the arrangement of the surface of the Earth. Geothermal is renewable and does not pollute, and there are places in many parts of the world that are seeking geothermal power. Geothermal is also very well suited for home heating and cooling, in which pipes are placed underground and a liquid is circulated through them, so that heat from the ground comes up during cold times, and cool from the ground comes up during hot times. Geothermal heating is becoming very popular, and is a cost-effective alternative to oil or gas home heating.

A highly developed form of alternative energy is hydroelectric. Hydroelectric power comes from dams which harness the power of rivers. The river water passes through turbines at the base of the dam, turning turbines which produce electricity. There are many dams in existence, and hydroelectric is a highly developed technology. There are dams in America, China, and elsewhere in the world. Hydroelectric is a clean, green technology which produces no pollution. Unfortunately, most of the lakes and rivers that could easily be exploited with hydroelectric have been dammed already, so the future of hydroelectric power lies in the development of less appealing sites. There are a number of hydroelectric projects in existence, in Africa, Asia and elsewhere.

Tidal power and wave power are two ocean-based technologies with high potential for providing clean, free energy in the future. Tidal power works when ocean water flows through tidal power stations as the water goes in and out with the tide, turning the turbines and producing electricity. Tidal power is not widely used, but as it develops it could become a very big thing. There are high potential tidal sites with very strong tides around the world, in Eastern Canada and Scotland among other places. Another renewable energy with high worldwide potential is wave power. Wave power seeks to convert waves into electricity by placing equipment on the oceans that captures wave movement and converts it into power. There are also efforts to harvest energy from the salt content and temperature of the ocean. The oceans of the world offers a huge possibility for electricity generation projects, and most of this potential is so far untapped and waiting to be explored.

Another interesting alternative energy source is the development of biomass technology. Biomass is a term for any kind of organic biological matter that can be converted into energy. Biomass technology is being created that will enable dung, for example from cows or pigs, or dead vegetable matter to be converted into energy. The transformation of these common substances, which would otherwise end up as waste, into electricity is an exciting area that has a great deal of potential to produce energy from previously untapped sources without polluting the environment. Biomass is usually either plant matter, from either crops or forest waste, or fecal wastes. A subsection of biomass is biogas, natural gas produced from biological sources.

A similar and very exciting alternative energy area is biofuel. Biofuel is liquid fuel made from biomass, usually from plant matter. Biofuel is an exciting prospect because it will enable farmers to turn excess crops into fuel. The biofuel that is the main focus of research is ethanol, a form of biofuel that can be made from corn or sugarcane. Ethanol can be used to run cars, and there is an increasing interest in the use of ethanol to replace

or augment gasoline as a significant source of automotive fuel. Cars must be specially fitted to run on ethanol, but the price is worth it, as ethanol burns more cleanly than gasoline, producing fewer pollutants, and it can be made from domestic crops, reducing dependence on foreign oil. Ethanol from sugarcane already makes up about forty percent of the fuel used by automobiles in Brazil, and this is a huge factor in Brazil's energy independence. In the United States the ethanol is made from corn, a plentiful crop in the American Midwest, and the United States government has ethanol initiatives and mandates to promote the use of ethanol. Additionally, there are many American states with their own ethanol initiatives and mandates. Major car companies are building ethanol-powered cars, and gas stations are creating ethanol fueling stations, and the use of ethanol is definitely on the rise. Gasoline can be combined with ethanol to create gasohol, and a popular form is E85, a blend of eighty-five percent ethanol and fifteen percent gasoline. There is also E10 and E15. Cars called "flex-fuel" cars are available that are flexible in their fuel use, meaning that they are able to run on either gasoline or ethanol. There is a form of ethanol called cellulose ethanol, being developed in research laboratories, which is made from inedible biomass and burns more cleanly than normal ethanol.

Another form of biofuel is biodiesel, a fuel that is like diesel but which is made from biomass. Biodiesel can be used in any engine that run on diesel, making the switch to biodiesel very easy, and it is widely useful. Biodiesel can be made from waste vegetable oils produced from cooking, and also from palm oil and canola oil, and from jatropha plants. Biofuel is a high potential area as it will have a real effect in reducing our dependence upon foreign oil for gasoline consumption, which is a key element in our addiction to oil, and as global demand for oil grows the use of ethanol and biodiesel will grow as well.

An area related to alternative energy is hydrogen fuel cells for cars. A hydrogen fuel cell is a device that is being developed which will run a car using only hydrogen as fuel, to reduce the demand for gasoline and foreign oil and to promote green energy. The exhaust from cars is one of the chief factors in air pollution and this technology will enable cars that will have no exhaust. The technology involves a chemical reaction with hydrogen and oxygen that produces electricity, with water as the only created waste product. Many companies are involved in the research and development of hydrogen fuel cells and this will be a very hot area in the near future. The only problem with hydrogen fuel cells is that there is a cost to produce the hydrogen used as fuel.

Aside from renewable energy, there are also alternative energy areas in oil and natural gas, which consists of alternative oil and gas exploration. The traditional reserves of oil and natural gas are becoming depleted, and the global economy's insatiable demand for energy will make previously untapped reserves of oil and natural gas highly profitable. Alternative oil and gas exploration will find and exploit deposits of oil and gas that will help serve to supply energy to the global demand as resources become scarce. The various forms of alternative oil and gas exploration include oil sand, shale oil, basin centered gas accumulation, tight gas, and coal bed methane, as well as other areas.

Two kinds of alternative oil exploration are oil sand, which is also called tar sand, and shale oil. Oil sand is a kind of sand from which oil can be extracted. There are large oil sand reserves in western Canada, centered in the Alberta region, so much so that it makes Canada a major potential source of oil on equal footing with the Middle East, and the exploration of oil sand is a very hot area. A growing oil extraction infrastructure has grown up around the Canadian oil sands, and there are many opportunities in that area.

Shale oil is another kind of energy consisting of oil pressed from shale. There are shale oil reserves in Utah and elsewhere, and this is a very interesting field. Companies are competing for the rights to develop shale oil, and as the infrastructure comes on line shale oil could produce a lot of oil. Oil sand and shale oil represent sources of oil that have not been previously tapped, and if the oil can be extracted through cost effective methods then oil sand and shale oil could become highly profitable, as they will produce oil from nontraditional reserves that have not been depleted in a future when most traditional resources will have run out. This area is very exciting for energy companies as the traditional sources of oil dry up, and there are many companies currently working to exploit oil sand and shale oil reserves.

Methods of alternative natural gas exploration include basin centered gas accumulation, in which gas in a basin is extracted, tight gas, in which the gas is difficult to get to, coal bed methane, in which natural gas is extracted from coal beds, and gas to liquid technology, in which natural gas from distant locations is converted to a liquid for the purpose of transportation. It should be noted that natural gas is the cleanest of all the fossil fuels in terms of the toxic emissions released when it is burned, and it can be useful for electricity generation and home heating. These technologies should be closely watched as traditional oil and gas reserves become depleted.

There are also new methods of storing energy that are being researched and developed. These include new battery technologies such as improved rechargeable batteries for cars, new kinds of rechargeable batteries for electronic devices such as laptops and cell phones, and the use of nano-technology in batteries. These battery technologies could revolutionize the storage of electricity and lead to improvements in the energy industry and to changes in automotive technology, as the battery becomes more energy efficient and eases the demand for electricity in electronic devices and cars that run on batteries.

Another way to reduce global oil consumption is through conservation of gasoline and battery-powered cars. Cars that are lighter and more energy efficient, which can get better mileage-per-gallon, significantly reduce the quantity of gasoline that is required for transportation demand. Electric cars, which run on electricity and can be plugged in to get their energy source, are an alternative to gasoline-powered cars. Plug-in hybrids can run on gasoline or on electricity, and there are also hybrid cars that augment their gasoline usage with motion-generated battery power. Hybrid cars have had some success and most major car companies have hybrid car programs.

One last kind of alternative energy to discuss is nuclear power. Often classified as a traditional power source, it is possible to think of nuclear as an alternative to fossil fuels.

Nuclear power plants do not produce air pollution, so they are clean compared to oil, gas and coal. However, nuclear power produces radioactive waste as a byproduct, and nuclear reactor accidents can have catastrophic effects, so the environmental value of nuclear is debatable. However, it cannot be denied that nuclear power can replace fossil fuels to some extent as they run out, and there are many countries around the world that are currently planning to build new nuclear power plants.

An area that relates to alternative energy in terms of being friendly to the environment is green building. Green building consists of erecting buildings that are environmentally sound and energy efficient. This can be done through better heating insulation, more efficient electrical appliances such as fluorescent lighting, and other structural elements. Green building is environmentally friendly, and it also saves money because it reduces energy consumption. Another green idea is pollution credits. Pollution credits, also called emissions trading, is a program in which the government establishes a total limit for pollution, and companies that pollute less can sell their right to pollute to the companies that pollute more. This creates a financial incentive to cut pollution. Green building, pollution credits and public transportation can all contribute to reducing pollution and saving the environment.

President Bush said in his 2006 State of the Union address that alternative energy is very important to America's future as an industrial leader. Investors need to keep track of these alternative energy areas in order to take advantage of the growing trends in the energy industry. There are two factors that will drive alternative energy growth to historic highs in the years to come. First, the "Peak Oil" scenario, in which global oil reserves run out and the oil-based world economy must transition to an alternative energy-based global economy. Second, the need to prevent global warming and engage in an ecologically sustainable lifestyle will lead to the encouragement of environmentally responsible renewable energy. Government initiatives combined with private enterprise will grow the alternative energy industry a very great deal in the near future, and this growth will affect individuals, companies, nations, and the entire world. There are many opportunities for businesses and investors to put money into alternative energy and reap the rewards of the coming future growth.

Alternative energy is attractive to all different sorts of people, including investors and entrepreneurs. A main reason for this is the fact that alternative energy can appeal to both individuals and families on the one hand and to corporations and businesses on the other hand. Alternative energy sources, particularly solar and geothermal, can be used on a small scale for home heating. The use of solar panels or geothermal pipes for individual homes can enable households to decrease home heating bills and break away from dependence on gas and oil. As the price of home heating rises this will make alternative energy more popular and spread the technology among individual households. Solar power and wind power can also be used for home electricity production, enabling households to remove themselves from costly electrical grids and produce their own electricity more cheaply and with greater concern for the environment.

Simultaneously with household use, alternative energy is going to become popular with corporations and businesses. The price of oil is continually rising and global supplies of light sweet crude oil are running out. Also, oil production is controlled by a cartel of countries who drive the price up and make oil overpriced in American markets. This is going to make oil an unattractive option for industrial purposes in the future. The prospects for coal, natural gas and nuclear are also bad, due to both financial and environmental reasons. Global supplies of coal, natural gas and uranium are becoming depleted, and these energy sources produce pollution on a scale that is undesirable. These factors are going to lead businesses and corporations to turn to alternative energy sources for their electricity. There are many cases of businesses using green building to reduce energy costs and relying on renewable energy to have a reliable and cost-effective source of power. As alternative energy supplies become economically feasible they will be adopted by conventional businesses, to the point of becoming mainstream in the future, and the companies that supply alternative energy stand to make substantial profits by supplying energy to these companies.

Several factors will also make the American government support the development of alternative energy. The first is the need for energy independence. The disaster of hurricanes Katrina and Rita showed that the American supply of petroleum, based on pipelines coming from the gulf coast, is unstable due to potential bad weather conditions, and alternative energy sources will help America become less dependent upon oil pipelines. More importantly, alternative energy will also help America become less dependent upon foreign oil, particularly from the Middle East, which is in the national interest. American dependence upon foreign oil is a major issue due to the political instability of the Middle East, it involves a huge political and military commitment by the United States to peace in the Middle East, and alternative energy will help to alleviate the situation and enable America to break free from dependence upon the Middle East and foreign oil. This could help America disentangle itself from its problematic relations with Iraq, Iran, and the other major oil-producing countries of that region. In fact, the American government has already enacted several measures to promote the alternative energy industry, both giving grants for research and taking steps to make alternatives more competitive through government incentives, and more are sure to come.

Aside from the need for energy independence, alternative energy will also grow and become common due to environmental necessity. Alternative energy is not just cost-effective and necessary for foreign policy, it is also required for domestic policy, to promote a sustainable environment and to prevent global warming and the worldwide catastrophe that advanced global warming could create. The cause of environmentalism is becoming increasingly popular, among both experts and ordinary people, politicians and businessmen, liberals and conservatives, scientists and religious leaders. As the majority of people learn to understand the threat of global warming, and the beauty of a well-preserved environment, the public will demand more renewable energy.

One of the primary reasons that alternative energy is so attractive is that conventional fossil fuel supplies are running out. The evidence for this is presented in the case for the "Peak Oil" theory that has been endorsed by many experts. As oil, coal and natural gas

supplies become scarce there is going to be a shortage of energy resources. Uranium supplies are also being depleted and are becoming expensive to develop, and nuclear is too unsafe to provide a complete solution. Alternative energy sources stand poised to fill this gap. As global fossil fuel reserves become depleted, industries will be forced to convert to new energy supplies in order to remain competitive. There is an important opportunity for alternative oil and gas exploration to provide the necessary oil and gas resources to last us until renewable energy infrastructure can be created to satisfy world energy demand. There is already growing concern among businessmen and government officials over diminishing oil supplies. With the majority of traditional world oil reserves in the politically unstable Middle East, and the vulnerability of American oil pipelines revealed by Hurricanes Katrina and Rita, there is a growing recognition that America needs to develop alternative energy supplies. Solar power, wind power, hydroelectric power, geothermal power, tidal power, biomass, biofuels such as ethanol and biodiesel, and hydrogen fuel cells have the potential to help the American energy industry and to ameliorate American dependence upon foreign oil. Nontraditional oil and gas exploration will provide the rest of the energy needed to satisfy the American and global hunger for energy.

It is clear that American reserves of oil and natural gas are not sufficient to satisfy the needs of American industry, and foreign oil is becoming increasingly expensive in both monetary and political terms. As conventional oil supplies run out there will be serious problems with energy production, both in America and worldwide. As alternative energy supplies become cost effective, alternative energy will supplement and eventually replace the scarce and environmentally unfriendly traditional fossil fuels. Alternative energy is becoming popular not only in the USA, but around the world, in India, Bangladesh, China, Indonesia, the Philippines, Australia, Scotland, England, Ireland, Germany, Italy, Denmark, the Netherlands, Spain, the United Arab Emirates, Uganda, Nigeria, and Brazil, and many other places. The most exciting area in energy today is alternative energy, and there are many opportunities for entrepreneurs, investors and companies that are interested in this field. It is also clear that in the future the environmentalist movement will play an increasingly important role in protecting the future of the planet. We hope that you will look to Alternative Energy News Source ([www.Altnews.com](http://www.Altnews.com)) as your source for information about trends and growth in alternative energy.