

Alternative energy

Alternative energy is defined as energy fuelled in ways that do not use up natural resources or harm the environment. This energy derived from non-traditional sources. Such as, compressed natural gas, solar, hydroelectric and wind. Alternative energy is not popularly used and is usually environmentally sound. It also comes from any source of usable energy intended to replace fuel sources. Actually, alternative energy does not produce any green house gas. It also does not contribute any factor of global warming. Today, a lot of countries consider using alternative energy instead of traditional energy to protect our planet. Moreover, some companies have started to invest their money to develop more alternative technologies to produce different kind of energy.

Ambient electric energy

Ambient electric energy is produces from any form of energy. The original form of energy usually refers to those generated in daily activities. A lot of designers and scientists believe that, it is able to produce electric power from different kinds of sources. Such as, human power energy, radio waves and transition wires. Therefore, they try to research and develop several new technologies in this recently years. Traditional energy sources from our planet are limited. However, today's advanced technologies increase more alternative sources to generate energy. This energy is more flexible and efficient.

Batch production

Batch production often uses in industrial field. It requires large quantity of items has been produced together at a same time. It is the manufacturing technique of creating a component at workstation before moving to the next step in production. The batch method can be advantages for produce a range of products. It is cheaper to produce a number of each item in one go because machines can be used more effectively, the materials can be bought in bulk and the workers can specialise in that task. Therefore, the workers can able to concentrate their skills. However, batch production requires an accuracy planning to decide what batch will be produced. This is because it is difficult to change to another batch when the production has been started. That mean it will lose the time and the output. In addition, batch production can build up of significant "work in progress" or stocks. For example, completed batches waiting for their turn to the next step. Then the cost is increased caused by taking up space and raising the chance of damage to stock.

Centralized power generation system

Centralized power generation system is a large single control power system. Such as, coal, nuclear power, gas, geothermal and etc. The maximum output power of central power station is between 150,000 and 800,000 kW. The central unit generates power, and then the power is delivered to electrical consumers at their place and in a ready-to-use form. Typical power station uses two or more fossil fuel combustions or nuclear boilers for a power generator and connects with a generating plant. Then it can share the switching, operating, fuel loading and other facilities. Therefore, it can produce a lower cost energy. Moreover, centralized power generation system can produces large amount of reliable, and stable voltage electricity. On the other hand, it is unsustainable energy. This is because pollution is occurred during running of the generating plant.

Decentralized power generation system

Decentralized power generation system also called system distributed power generation system. It is a multi-utility power system, which can reduce the amount of energy lost during the electricity transmission. This is because generating unit is built very near where it is used. It also reduces the length of power lines. In the other hand, the concept of distributed power generation is using many small generators, which only 25 to 1000 kW output, rather than a few large generators. Also, the renewable power generation system is under the distributed power generation system category because they contain several small size units to connect electric utility network. Such as, solar energy, micro power generation, wind power, and hydro generation are distributed power generation system.

Energy policy

Energy policy is the manner in governments and organizations. They decide the policy of energy development including energy production, distribution and consumption. They also focus on increase collective energy security through diversification of their energy sources and improved energy efficiency. On the other hands, they ensure to increase competitive economy and protect the environment during resource consumption. Moreover, they try to analysis and co-operates in the development of energy efficiency and energy diversification. Such as, electricity, natural gas, coal and renewable energy sources. Furthermore, they integrate all environmental concerns into energy policy.

Fuel cells

Fuel Cells are direct fuel-to-energy power generator. It provides high quality direct current for base load, emergency power, portable power and transportation. The converting energy from fuel does not like traditional power generator. Fuel cells also are devices that use electrochemical principles to convert external supplies of hydrogen and oxygen into electricity without CO₂ emissions. Actually, fuel cells use chemical reaction to produce thermal energy and then transform to kinetic energy to generate electricity. Moreover, fuel cells can be paralleled to operate on any power requirement. Also, it produces extremely high temperature during operation. Thus, it is particularly suited to combine heat and power installation.

Fully functional prototype

Prototype is a model of design product. It is used for present a product or testing. Actually, prototype separates to four different basic categories, which are proof-of-principle prototype, form study prototype, visual prototype and fully functional prototype. Fully functional prototype also called a working prototype. It is the final stage of prototype making to simulate the final design, aesthetics, materials and functionality of the intended design. Sometime, the fully functional prototype could be scale down to reduce the cost. Also, fully functional prototype can give the engineers to final check for design flaws and allows last-minute improvements to be made before mass production.

Global warming

Global Warming is defined as the increase of the average temperature on our planet. That mean is the temperature of the Earth is getting higher. Therefore, many disasters are occurring more frequent. Such as hurricanes, droughts and floods. Since the middle of the 20th

century, most of the observed temperature increases caused by 2 different factors. The first factor is human activities, which are excess fossil fuel burning and deforestation. Another factor is natural phenomena, which are solar radiation and volcanoes. Increasing global temperature will cause higher sea level. This is because higher temperature melts ice village and destroys glaciers. As the result, the global climate has been changed to different extreme weather. For example, desert is extended when the temperature of subtropical area is getting hotter.

Green product

Defining a product as “green” is not easy. The product must be good for environment and health. Green product should be considering the designing, material, manufacturing, operating and life-cycle. Early, many governments attempt to identify what are green products. Such as, United States, Canada, Germany, Netherlands, Japan and Singapore. They focused on the development of different eco-labels to represent which are green products. For example, Energy Star is one of the eco-labels. When the product has Energy Star label, that mean has a high efficient of energy consumption.

IEA

The International Energy Agency (IEA) is an intergovernmental organisation, focuses on global energy policy. It also has 28 member countries. They attempt to ensure reliable, affordable and clean energy for their citizens. During the oil crisis of 1973-74, the energy markets have changed so the IEA was founded. The aim of the IEA is balancing the energy policy of “Three E’s”, which are energy security, economic development and environmental protection. Their current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major consumers and producers of energy like China, India, Russia and the OPEC countries. Moreover, the IEA has around 190 staff. They are mainly energy experts and statisticians from 28 member countries. The IEA also conducts a broad programme of energy research, data compilation, publications and public dissemination of the latest energy policy analysis and recommendations on good practices.

Industrial waste

Since the industrial revolution, the operation of industrial and mining have been accompanied by a serious problem. This is an industrial waste. Industrial waste is a type of waste produced by industrial activity. Much industrial waste is neither hazardous nor toxic. Normally, toxic waste and chemical waste are two of industrial waste. They are produce different kind of pollution, such as air pollution, water pollution. Industrial waste is divided into hazardous and non-hazardous waste. Hazardous waste may result from manufacturing or other industrial processes. Certain commercial products such as cleaning fluids, paints or pesticides discarded by commercial establishments or individuals can also be defined as hazardous waste. Non-hazardous industrial waste defined not meets the EPA's definition of hazardous waste - and are not municipal waste.

Risk analysis

Risk analysis is a technique to identify, evaluate and assess different factors. Such as, time, cost, manufacture and etc. It maybe influences the success of a project or achieving an objective. It helps to avert possible negative effects on running project. This technique also

measures the balancing between risks and benefits to make the project to successful. Risk analysis should begin at a product's concept stage and continue until stop the product line. The earlier that hazards are identified, then the greater chance to avoid the risk.

Wastewater reuse and treatment

The global demand of water is increasing when population of the world is growing. In addition, high quality living standard, expansion of industrial and huge of economic activities also increases the demand of water. Therefore, a lot of wastewater is produced from different way. As a result, development of wastewater reuse system and water demand management are essential. Wastewater treatment produces a lot of CO₂ emissions, so prolong life cycle of the wastewater can decrease CO₂ emissions. In modern wastewater management system should be considered. According to Abbassi et al. in 2000, the major functional elements of wastewater management should be generation, reuse, treatment, composition and collection. Unfortunately, treatment and distribution of recycled water need a lot of resource. In 2004, Bahman Sheikh (Water Reuse Consultant, San Francisco, California, USA) stated that, water reuse projects face two major barriers. The first one is from government politics. Different countries have different politics for water reuse so they need a long time to negotiate. Pricing of recycled water is another barrier. This is because some developing and undeveloped countries cannot afford it.

Wind turbine

Wind turbine is generator. It is powered by wind pushing against fan blades. Wind turbine is a rotating machine, which converts the kinetic energy of wind into mechanical energy. The mechanical energy is instead converted to electricity, and then the machine is called wind turbine. It also called wind generator, wind power unit (WPU), wind energy converter (WEC), or aero generator. Similar with solar photovoltaic power, wind power is also without any fuel costs but it has limited applications. This is because wind is a free source of fuel for wind turbine and it only operates when the wind is blowing.