

# Essay on alternative fuel technologies

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Oil and petroleum products have been mainstay of world's economic and technological advancement since past 150 years. The mechanism driving the entire transportation system from automobiles, airplanes, railways, ships to space rockets is based on utilization of energy of petroleum oil. Petroleum products are also extensively used in a number of infrastructure industries that form the core of industrial processes and basis of existence of modern world. However, the petroleum resources of world are very limited and they cannot endlessly meet human demands.

Various estimates have put the total extractable oil stock to exist for another 50-75 years if world continues to consume them at present rate. After that the cost of extraction of remaining petroleum products would become much more than the benefits obtained them and world would require new resources of energy to exist. These concerns have already spawned intense research in alternative technologies to meet the future energy needs in the face of an impending petroleum crisis.

The shortage of oil would be more manifest in coming times as oil demands are growing world wide, especially in China and India with rapidly expanding economy, transportation system and consequently requirement of petroleum oil. Even at present consumption rate there are grave uncertainties on the secure prospects of future supplies within next 50 years time frame, and the rising consumption rates threatens to bring the approaching crisis nearer.

United States is thus faced with a great responsibility to secure its future interests without sacrificing its present requirements and needs. This issue forms the topic of the next section. Alternative fuel technologies Past decade has seen great thrust on technological researches in alternative fuels.

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Various new techniques and models have already been introduced in the market to test their viability and capacity to successfully replace petroleum as chief source of energy.

Most of these innovations are specifically aimed at transportation sector owing to its liability as chief consumer of petroleum oil and as principle cause of soaring oil imports. Due to distinct requirements of different sectors in transportation, the technologies vary. Passenger vehicles, public transport vehicles and freight transportation carry specific needs that are difficult to be met by a single alternative fuel technology (Deutch J, Schlesinger J. R, Victor D. G. 2006).

Some of the major and most popular of these technologies, where majority of research and development has taken place, are (Aldrich, 1996) 1. Hybrid Vehicle: As the name suggests, hybrid vehicles combine dual technologies for their operation. Technically they are hybrid electric vehicle with an electric motor that drives the vehicle (Hoogma, Kemp, Schot and Truffer, 2002, 41 ). 2. Bio-diesels: Bio-diesel: Bio-diesel, as the term suggests, is a type of renewable fuel obtained by agricultural products and used as fuel in heavy-duty vehicles.

The major sources currently under research for bio-diesel are soybean, rapeseed, corn, cottonseed, peanut, sunflower, and canola (Aldrich, 1996, 85). 3. Ethanol: Ethanol has emerged as a successful alternative to fossil fuels in Brazil where more than 4 million vehicles on ethanol based fuel and it is finding increasing application in the world as well 4. Hydrogen: : There are great interests in using hydrogen as fuel in transport industry due to the great flexibility of options and performance it offers.

Hydrogen can either be used as fuel in place of gasoline in internal combustion engine or it can be used as energy carrier in fuel cells, the latter being the major research area in automobile sector (Aldrich, 1996, 87). Solar energy: : Solar power has turned as a dependable source of energy in areas other than transport. All the initial costs are high in maintaining a solar energy power plant, its been shown that with increasingly sophisticated technology and wider application the cost of installation as well as generation of electricity can get comparable to normal power plants. Mass Transport System

Apart from introducing alternative fuel and technologies to replace and minimize fossil fuel consumption, another area where fuel consumption can be easily reduced is creating a more robust and functional public transport and mass transit system. It is cost effective and time consuming to redesign the existing public transport system, especially in major cities, to cut down fuel consumption by reducing number of vehicles on the road. Socio-cultural impact When fossil fuels were discovered around 150 years back, the existing technologies of steam engines were unable to utilize them.

However, soon completely new technologies were developed in the face of these new energy sources and they were used to capitalize on the energy content and efficiency of fossil fuels. Soon petroleum fuels revolutionized the way the world moved and worked. The past 100 years of consumption has comprehensively depleted non-renewable petroleum deposits and estimates give another 50 more years before the remaining available sources would get almost exhausted. This fact is indeed a cause of concern, but only if viewed from existing technological frame.

Declining petroleum resources offer the signal that its time to make transition towards different energy sources. Countries that would fail to read this signal or close their eyes to it are certainly heading for a major crisis. But fortunately the world has the capacity to read these signals and develop reliable intermediate technologies and systems such as hybrid electric vehicle, ethanol and public transit systems that would considerably reduce fossil fuel consumption without adding to infrastructure cost thereby extending the life period of petroleum reservoirs.

Meanwhile research can take place on new age technologies such as fuel cell and solar photovoltaic cells to complete replace fossil fuels as a source of energy. It is possible that if government and industry institute providential policy measures, there would be a host of alternative technologies in transportation sector by the time petroleum oil would get exhausted. \_

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