

FUTURE OF PETROLEUM RESEARCH

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The petroleum industry is credited to fuelling the world from the Modern Era to the Information Era. Indeed the petroleum industry has the outstanding record of technical, economical and social achievements during the Modern Era. The worldwide standard of living has seen the most dramatic improvement because of the availability of inexpensive energy sources throughout the youth and middle age of the petroleum industry. This was possible because of the pioneering efforts of the large international oil companies that set high standards for fundamental petroleum research and used innovation to differentiate their activities and to stay ahead of the competition. Along with national and local government agencies, industry strongly supported university programs to educate the required engineers and scientists. This coupling of research and education was extremely successful in filling the increasing energy demand while simultaneously reducing the costs to find, extract, transport and refine oil, and to deliver quality products to consumers. Typically, any investment in petroleum research paid dividends at least 10 fold. Despite this outstanding record, the petroleum industry has shown slowing down in research activities during its post-middle age (in business sense). Most recent rounds of painful restructuring, consolidations and layoffs that started in the 1980s have led to the closing of many research facilities and research support has declined or vanished in many cases. The prolonged research cutback produced a deficit in the creation of new ideas and out-of-the-box solutions for reducing costs and making technological breakthroughs in the petroleum industry. In fact, even value engineering, which has been so successful in other industries, has not really penetrated the petroleum industry. There are definitely some exceptions, but what is portrayed as fundamental research or investigative engineering is really orthodox design engineering. The desired outcome for the most part is incremental improvements in existing technologies.

In this paper, the future of petroleum research will be discussed, vis a vis the new world culture of environmental and social awareness. Options for developing technologies that are environmentally appealing, economically attractive, and socially responsible will be detailed. The future of oil and gas regulations and background research that would eventually lead to zero emissions electricity generation will be discussed. Finally, the role of the government as well as non-petroleum companies will be highlighted in the context of restructuring the fate of the energy industry in the Information Era.