## عنوان مقاله:

Evaluation of Hydrogen Integration between Nuclear Power Plant and Oil Refineries


## محل انتشار:

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تعداد صفحات اصل مقاله: 9



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## خلاصه مقاله:

World petroleum production cannot be sustained, and will begin to decline during the next ten to fifteen years. Petroleum represents 39% of US primary energy and 97% of its transportation energy. Hundred year time profiles for per capita supply were calculated for 108 possible combinations of peak production rates, peak years, field depletion rates, and population growth. An optimistic subset of assumptions produced per capita supply reductions of 17% and 45% in 2025 and 2050, respectively; a median subset increased those reductions to 31% and 64%. The energy capacity required for replacement of petroleum-based transportation energy is 312 GWe. 515 GWe would be required for hydrogen production, distribution, storage, and transfer. It could be produced by 515 1 000-MW nuclear reactors or 1.72 million 1- MW wind turbines. Subsequent replacement of natural gas would increase total energy demand to 798 GWe. Hydrogen storage as either a pressurized gas, liquid at 20K, or metallic hydride is technically feasible; however, all three pose significant practical difficulties. The impending loss of a major fraction of primary energy and essentially all transportation energy creates time- and resource-critical problems for the US and world economies. Major impacts on industry, agriculture, personal and mass transportation, and standard of living must be anticipated. Immediate action at both the national and international levels is necessary to mitigate potential effects. Oil refineries are sinking and nuclear power plants are source of hydrogen. In this paper, integration between oil refineries and nuclear power plant are discussed. Hydrogen network in oil refineries and supplied hydrogen in nuclear power plants were simulated and integrated by using REFOPT [3].



## کلمات کلیدی:

Nuclear, Power Plant, Hydrogen, Oil refinery, Integration