

Alternative primary energy for power desalting plants in Kuwait: the nuclear option I

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ABSTRACT

Some countries (e.g. Korea, China, India, Pakistan, Japan) were forced to adopt the nuclear energy option to generate electric power Ep (by nuclear power plants NPP) and desalt seawater D (by nuclear desalination ND) due to the rising cost of fossil fuel and its insecure supply. The increase of fuel oil consumption and cost (more than \$100 per barrel) motivate other countries, even oil exporting countries, to look for cheaper alternatives to produce both Ep and D. The locally consumed oil in these countries is deducted from its reserves and/or decreases its income. In addition, the green house gases (GHG) emission resulting from burning fossil fuel contributes to global warming and adversely affects the environment. In Kuwait and other Gulf cooperation countries (GCC), huge amounts of fuel (oil and natural gas) are consumed by co-generation power desalting plants (CPDP) to produce Ep and D. The use of this fuel to produce Ep and D cannot be expanded indefinitely as the oil supplies are finite and dwindling. Thus, less costly and sustainable new sources of energy such as solar, geothermal, wave, and wind energies are explored. The share of usage for these sources are so little and their wide expansions in the next decade are doubtful. Presently, nuclear energy is economically viable, and is a large-scale alternative to fossil fuel for generations of Ep and D. The use of nuclear energy (NE) raises many concerns about its safety, high capital cost, and radiation effects on surroundings and workers in the short and long term. The question raised should not be either to accept NPP or not, as it may be the only choice we have. The real questions are: how and when NPP will be inherently safe, economical, and when can it be applied safely in countries at different stages of development. Nuclear energy can present a sustainable way to produce Ep and D if its standing problems can be resolved. It can become a significant option for meeting the future world energy needs at low cost and in an environmentally acceptable manner. In this paper, the prospects of using nuclear cogeneration power desalting plants (N-CPDP) in Kuwait and some of the GCC are discussed. The conditions required to build NCPDP and its associated problems are outlined and discussed.

Keywords: Nuclear power plant; Cogeneration power desalting plant; Pressurized water reactors; Nuclear safety features; Oil; Gas; Coal; Fuel consumption; Desalted water; Consumption

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