

Article

Teaching Energy Economics in the GCC: A Synergistic Approach between Engineering and Economics

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Abstract: Issues related to safe and abundant energy production have been prominent in recent years. This is particularly true when society considers how to increase the quality of life by providing low-cost energy to citizens. A significant concern of the Gulf Cooperation Council (GCC) relates to the environmental effects of energy production and energy use associated with climate change. Efforts to reduce fossil fuel use and increase the use of renewable energy, together with the price volatility of fossil fuels, have seriously impacted the economics of many oil-producing countries, particularly the Gulf States, which has led to efforts to make their economies more diverse and less dependent on oil production. In this article, we introduce a multidisciplinary energy economics course developed at the Missouri University of Science and Technology that can be easily adopted by GCC universities to enhance future generations' understanding of energy challenges.

Keywords: energy policy; energy economics; renewable energy; fossil energy; nuclear energy; hybrid energy; teaching



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1. Introduction

The question of how the Gulf States can expand their economies to reduce economic dependence on oil production is an engineering question, an economic question, and ultimately, an issue of information and education. The collaboration between engineering and economics focuses on the importance of economic diversification in energy and how to reduce dependence on oil while making GCC economies more resilient to oil price shocks.

Collective efforts from science, social science, and engineering are required to address the complex issue of improving social welfare, maintaining sustained economic growth, diversifying the economy and energy portfolio, and strengthening energy resilience in the GCC. Universities play an active role in the socioeconomic development of society, as they are sensitive to market demands and global trends [1]. We reacted to this broad energy debate several years ago by developing a course in energy economics at the Missouri University of Science and Technology (Missouri S&T) to provide a deeper understanding of the energy issues discussed above. With this paper, we aim to introduce and illustrate the design of the course and prepare the next global generation for the upcoming energy-related challenges. Our approach has been to link the scholarly disciplines of engineering and economics to provide an educational system to inform college students about the core energy issues debated worldwide. This course encourages open discussion about energy policies that countries may consider pursuing to bring the most significant benefit to their citizens. This course is available online and can easily be adopted by universities in the Gulf States.

Efforts have been made to enhance the teaching and understanding of energy-related topics in the literature. Energy-related issues were comprehensively discussed within the scope of economists by the authors of [2–4], who developed one of the earliest works

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