Time & Location: October 25, 2013 at 1:00 PM in Engineering I 288
Title: A Systems Approach to Sustainable Energy Portfolio Development

The current national energy policies have been set to adopt renewable energies in an attempt to combat global warming and to improve the national energy security. As a result, renewable energies are taking a larger share of the total energy supply worldwide, especially in the industrialized world. Although such policies might be effective in reducing the greenhouse gas emissions and the resulting global warming in the long run, they might have secondary impacts on the other valuable components of the ecosystem (e.g. water and land). The secondary impacts or the unintended consequences of the existing energy policies can be the barriers to sustainable development as pressure on one component of the interconnected complex ecosystem may lead to negative feedback effects on other components, leading to collapse of the whole system in the long-run. While conventional fossil energy sources need to be replaced with renewable, due to unsustainability of current world's energy consumption trend, this general policy should not result in deteriorating other valuable natural resources. Therefore, selection of sustainable energy sources should not be simply based on the carbon footprint criterion. There is a need for careful evaluation of different renewable energy options with a systems perspective which simultaneously considers different environmental as well as economic efficiency criteria.

The main research question in this study is "how to develop a sustainable energy portfolio with respect to the economic and environmental criteria, the regional capacities and limitations, data and performance uncertainties, and risk attitudes and expected utilities?"

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Approved for distribution by Kaveh Madani, Committee Chair, on January 1, 2015.

The public is welcome to attend.