



Title of the presentation: Impact of solar penetration on net electricity load profiles on Oahu, Hawaii

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Short biography

A noted international trade economist, Dr. Denise Eby Konan has worked extensively in Asia, the Middle East and North Africa. She has been a consultant to the World Bank, the Council of Foreign Relations, the Arab League, and governments of Egypt, Tunisia, Saudi Arabia, UAE, and Hawai'i and publishes on issues of regional economic integration, trade in services, intellectual property rights, foreign direct investment and energy. Dr. Konan is a Research Fellow at the University of Hawai'i Economic Research Organization (UHERO) and founding Director of the Center for Sustainable Coastal Tourism at the University of Hawai'i Sea Grant College Program. Dr. Konan served for two years as the Interim Chancellor and for three years as the Assistant Vice Chancellor of UHM. She received her undergraduate degree from Goshen College and her doctorate from the University of Colorado.

Abstract

This paper uses data provided by Hawaiian Electric Company (HECO) for the period from September 2010 to May 2014. The study explores the effect of customer mix of each distributed transformer on the shape of load profiles along with their variability. Results suggest that in a more residential-concentrated area, net load generally has two peaks — morning and night, while a more commercial-or industrial-concentrated area exhibits one midday peak. The shape of a given areas' load profile is mostly influenced by its customer-mix and the time-of-day, while its load volatility is largely the result of weather patterns and the level of PV penetration. Since solar power typically exhibits different generation characteristics from power produced by other conventional sources, more precise solar forecasts enable electric system operators to better manage electricity generation with fluctuating solar output.

Keywords: Net electricity load, Customer mix, transformer, shape of load profile, load volatility, and PV penetration

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