

Relieving Electric Power Dependency during Shortage with an On-Site Solar Power Supply

SangYun Choe

Department of Industrial Engineering
Seoul National University
Seoul, Korea
csy8959@snu.ac.kr

JinWoo Park

Department of Industrial Engineering
Seoul National University
Seoul, Korea
autofact@snu.ac.kr

Abstract

All over the world, only a fraction of potential solar energy is used in generating electricity. Especially in Korea, we use very little of solar powers in spite of the fact we have annual electricity shortage crisis during the summer or winter in accordance with the peak electricity demand. In this situation, photovoltaic electric power generation at the site of demand can be a good candidate solution. This study estimates the potential of solving the power shortages by calculating maximum and minimum of solar energy generation near the demand site through simulation studies.

Because the solar power generation technology is strongly influenced by external factors, we consider external factors such as possible installation area, solar irradiation on a tilted module surface, the number of inverters, temperature, etc. and estimate the maximum and minimum of power output in a dynamic situation. In addition, we studied economic analysis of the solar power system. This study could be a good policy guide for expanding the solar power supply.

Keywords

Solar power supply, New renewable energy, Photovoltaic, Solar energy

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Biography

SangYun Choe was born in Changwon, Republic of Korea on May, 22th, 1989. He received his bachelor's degree in Industrial and Information systems engineering from Seoul National University of science and technology, Seoul on 2013. At 2013, he entered the graduated school of Seoul National University. He is currently a master's candidate and he has studied for his doctor's degree in Industrial Engineering at Seoul National University. His current research interests are in manufacturing system, simulation, and photovoltaic, renewable energy.

JinWoo Park was born in Seoul, Korea on December, 18th, 1952. In 1985, he received a Ph.D. degree in Industrial Engineering at University of California, Berkeley and now he is a professor of Industrial Engineering at Seoul National University. His current research interests are in manufacturing systems engineering, simulation, scheduling, Enterprise Resource Planning/Supply Chain Management and Flexible Manufacturing System/CIM. He is a member of Institute of Industrial Engineers (IIE), Society of Manufacturing Engineers (SME), Association of Computing Machinery (ACM), Institute of Electrical & Electronic Engineers (IEEE), American Production & Inventory Control Society (APICS).