

EGU2020-6503

<https://doi.org/10.5194/egusphere-egu2020-6503>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



## Estimation and validation of electric power output from a fixed-type floating photovoltaic system

Jangwon Suh<sup>1</sup>, Sungmin Kim<sup>2</sup>, and Yosoon Choi<sup>3</sup>

<sup>1</sup>Kangwon National University, Energy and Mineral Resources Engineering, Korea, Republic of (jangwonsuh@kangwon.ac.kr)

<sup>2</sup>Kangwon National University, Energy and Mineral Resources Engineering, Korea, Republic of (smkim19@kangwon.ac.kr)

<sup>3</sup>Pukyong National University, Energy Resources Engineering, Korea, Republic of (energy@pknu.ac.kr)

An accurate estimation of electric power production (EPP) is a crucial first step to design a floating photovoltaics (PV) project. This study estimates the EPP of a floating PV system and validates the results by comparing with the actual EPP observed at the Hapcheon Dam, Korea. Typical meteorological year data and system design parameters were entered into System Advisor Model (SAM) software to estimate the hourly and monthly EPPs. Three-year average observed EPPs (2012, 2013, and 2015) were used as reference values for the validation. The results showed the seasonal EPPs were the highest in spring and the lowest in winter. The monthly estimated EPPs were lower than the monthly observed EPPs. These results are ascribed to the fact the SAM was unable to consider the natural cooling effect of the water environment on the PV module. The error results showed it was possible to estimate the monthly EPPs with an error of less than 15% simply by simulation. However, it may possible to estimate the monthly EPPs with an error of approximately 9% when considering empirical results: The floating PV efficiency was approximately 1.1 times (110%) the overland PV efficiency. This indicates that the approach of using empirical results can provide reliable monthly estimation of EPP in feasibility assessment stage of floating PV projects.